Mini System

FW850C/21/21M/22/34

FW855C/21/21M/34

Service
Service
Service

Service Manual

COMPACT disc DIGITAL AUDIO

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CLASS 1
LASER PRODUCT

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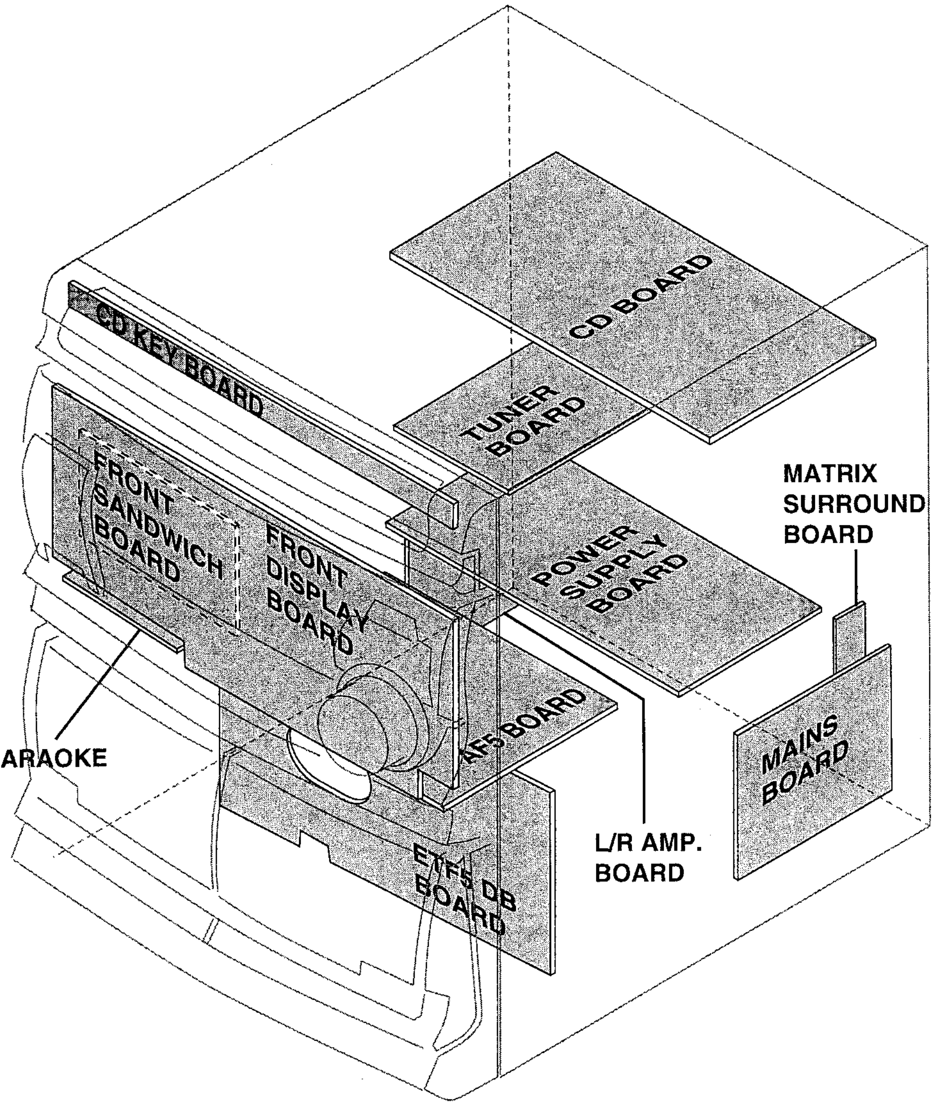
GB 4822 725 25792

PCS 100 013

PHILIPS

LOCATION OF PRINTED CIRCUIT BOARDS


CD KEY BOARD
CD BOARD
TUNER BOARD
FRONT SANDWICH BOARD
FRONT DISPLAY BOARD
POWER SUPPLY BOARD
MATRIX SURROUND BOARD
KARAOKE
AF5 BOARD
MAINS BOARD
L/R AMP. BOARD
ET/F5 DB BOARD

VERSION VARIATIONS:

Versions Features & Board in used:	FW850C				FW855C			
	/21 /21M	/22	/34		/21 /21M	/33	/34	
Aux Input	x	x	x		x	x	x	
Line Output	x	x	x		x	x	x	
Subwoofer Output	x	x	x		x	x	x	
Surround Output								
Digital Output	x	x	x		x	x	x	
Dolby B	x	x	x		x	x	x	
RDS		x	x				x	
CD Text		x	x				x	
Karaoke Feature	x				x	x		
Tuner board - ECO5 Sys	x				x	x	x	
Tuner board - Tuner 95		x	x					
Tape pc board - DB/DD/FR	x	x	x		x	x	x	
Matrix Surround Speaker connection					x	x	x	

SPECIFICATIONS

GENERAL:

Mains voltage : 100V for /26
110-127V/220-240V Switchable for /21
120V for /37
220V for /33
220-230V for /22/34
230V for /25
230-240V for /30
Mains frequency : 50/60Hz
Power consumption : < 2W on Display off mode /22
< 18W on Standby mode
< 145W at 1/8 rated power out
Clock accuracy : < 4 seconds per day
Dimension centre unit : 265 x 310 x 365mm

TUNER:

FM

Tuning range : 87.5-108MHz
65.81-74MHz for /34
Grid : 50kHz/100kHz for /21
30kHz for /34
IF frequency : 10.7MHz ± 25kHz
Aerial input : 75ohm coaxial
300ohm click fit for /37
Sensitivity at 26dB S/N : < 7µV
Selectivity at 600kHz bandwidth : > 50dB
Image rejection : > 25dB [> 75dB]
Distortion at RF=1mV, dev. 75kHz : < 3% [< 2%]
-3dB Limiting point : < 7µV
Crosstalk at RF=1mV, dev. 40kHz : > 18dB [> 26dB]

MW

Tuning range : 531-1602kHz
530-1700kHz for /21/37
Grid : 9kHz
10kHz for /21/37
IF frequency : 450kHz ± 1kHz
Aerial input : Frame aerial
Sensitivity at 26dB S/N : < 4.0mV/M
Selectivity at 18kHz bandwidth : > 18dB
IF rejection : > 45dB
Image rejection : > 28dB
Distortion at RF=50mV, m=80% : < 5% [< 7%]

LW

Tuning range : 153-279kHz
Grid : 3kHz
IF frequency : 450kHz ± 1kHz
Aerial input : Frame aerial
Sensitivity at 26dB S/N : [< 7.0mV/M]
Selectivity at 18kHz bandwidth : [> 24dB]
IF rejection : [> 26dB]
Image rejection : [> 35dB]
Distortion at RF=50mV, m=80% : [< 7%]

AMPLIFIER:

Output power at 1kHz, THD10%(RMS):
L & R : 2 x 130W ± 1dB at 6 ohm for FW850C
2 x 120W ± 1dB at 6 ohm for FW855C
Surround : 20 W at 2 x 6 ohm for FW855C only
Frequency response within -3dB : 40Hz-18kHz
Dynamic Bass Boost [1] : BEAT
: PUNCH
: BLAST
: DBB Off
Digital Sound Control : Rock, Classic, Techno, Optimal
Incredible Surround : IS ON, IS Off [1]
Input sensitivity
Aux/Line-in : 350mV ± 2dB at 47 kohm
Mic : 2.5mV ± 2dB at 600 ohm
Output sensitivity
Line-out : 500mV ± 2dB at 22 kohm
Sub-woofer (max. vol.) : 1.4V ± 2dB at 22 kohm
Digital-out : 44.1kHz
Headphone : 15mW at 32 ohm

CASSETTE RECORDER:

Number of track : 2 x 2 stereo
Tape speed : 4.76 cm/sec ± 2%
1.6 x 4.76 cm/sec
Wow and flutter : < 0.6% DIN
Fast-wind/Rewind time C60 : 130 sec
Bias system : 75kHz ± 10kHz
Rec/Pb frequency response within 5dB : 80Hz - 12.5kHz
Signal to noise ratio (IEC I) : > 44dB
Signal to noise ratio (IEC II) : > 47dB
Dolby NR Factor : > 8.5dB

COMPACT DISC:

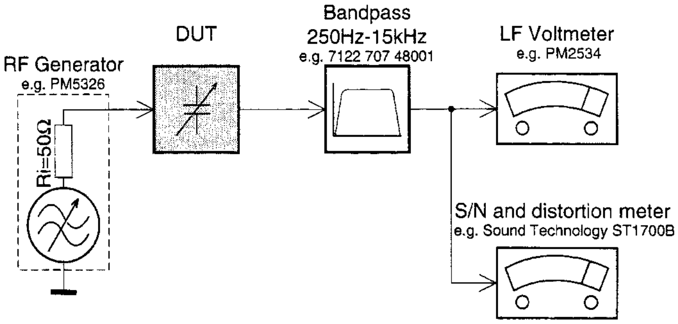
Measurement done at output conn. of the CDC module.
Frequency response within ± 3dB : 20Hz - 20kHz
Output level (in Vrms) : 550mV ± 2dB unloaded
Signal/Noise ratio (A-weighted) : > 80dBA
Distortion at 1kHz : < 0.5%
Channel difference at 1kHz : < 1dB
Channel crosstalk at 1kHz : > 45dB
De-emphasis : 0 or 15/50 mS (Switched by subcode on the disc)

[....] Values indicated are for "Tuner 95 Board" only

[1] Frequency response in each setting is software controlled.

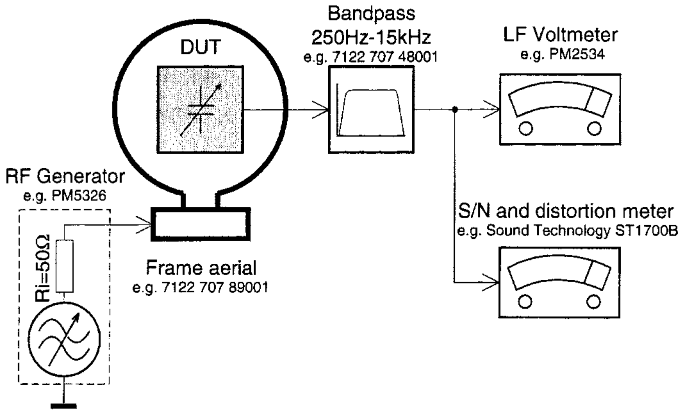
MEASUREMENT SETUP

Tuner FM


Bandpass
250Hz-15kHz
e.g. 7122 707 48001
DUT
LF Voltmeter
e.g. PM2534
RF Generator
e.g. PM5326
Ri=50Ω
S/N and distortion meter
e.g. Sound Technology ST1700B

Use a bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from the pilottone (19kHz, 38kHz).

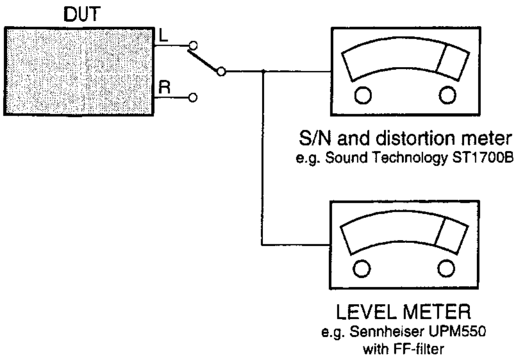
Tuner AM (MW,LW)


Bandpass
250Hz-15kHz
e.g. 7122 707 48001
DUT
LF Voltmeter
e.g. PM2534
RF Generator
e.g. PM5326
Ri=50Ω
S/N and distortion meter
e.g. Sound Technology ST1700B
Frame aerial
e.g. 7122 707 89001

To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday´s cage.
Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

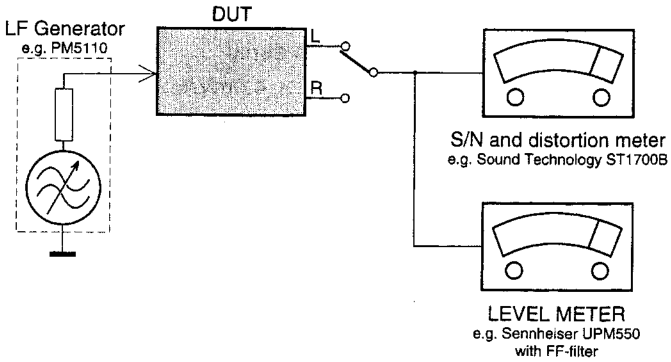
CD

Use Audio Signal Disc SBC429 4822 397 30184
(replaces test disc 3)


DUT
L
R
S/N and distortion meter
e.g. Sound Technology ST1700B
LEVEL METER
e.g. Sennheiser UPM550
with FF-filter

Recorder

Use Universal Test Cassette **CrO2** SBC419 4822 397 30069
or Universal Test Cassette **Fe** SBC420 4822 397 30071


LF Generator
e.g. PM5110
DUT
L
R
S/N and distortion meter
e.g. Sound Technology ST1700B
LEVEL METER
e.g. Sennheiser UPM550
with FF-filter

ESD

GB WARNING

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance. Keep components and tools also at this potential.

F ATTENTION

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).
Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

D WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kan die Lebensdauer drastisch reduzieren.
Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.
Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

NL WAARSCHUWING

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.
Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

I AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

GB

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified, be used.

NL

Veiligheidsbepalingen vereisen, dat het apparaat bij reparatie in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.

F

Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utiliséés les piéces de rechange identiques à celles spécifiées.

D

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Original zustand des Geräts darf nicht verändert werden; für Reparaturen sind Original-Ersatzteile zu verwenden.

I

Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambio identici a quelli specificati.

"After servicing and before returning set to customer perform a leakage current measurement test from all exposed metal parts to earth ground to assure no shock hazard exist. The leakage current must not exceed 0.5mA."

"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre appareil en panne".

CLASS 1
LASER PRODUCT
3122 110 03420

GB Warning !

Invisible laser radiation when open.
Avoid direct exposure to beam.

S Varning !

Osynlig laserstrålning när apparaten är öppnad och spärren är urkopplad. Betrakta ej strålen.

SF Varoitus !

Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkymättömälle laserisäteilylle. Älä katso säteeseen!

DK Advarse !

Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.

SERVICE AIDS

Service Tools:

Universal Torx driver holder	4822 395 91019
Torx bit T10 150mm	4822 395 50456
Torx driver set T6 - T20	4822 395 50145
Torx driver T10 extended	4822 395 50423

Cassette:

SBC419 Test cassette CrO2	4822 397 30069
SBC420 Test cassette Fe	4822 397 30071
MTT150 Dolby level 200nWb/M	4822 397 30271

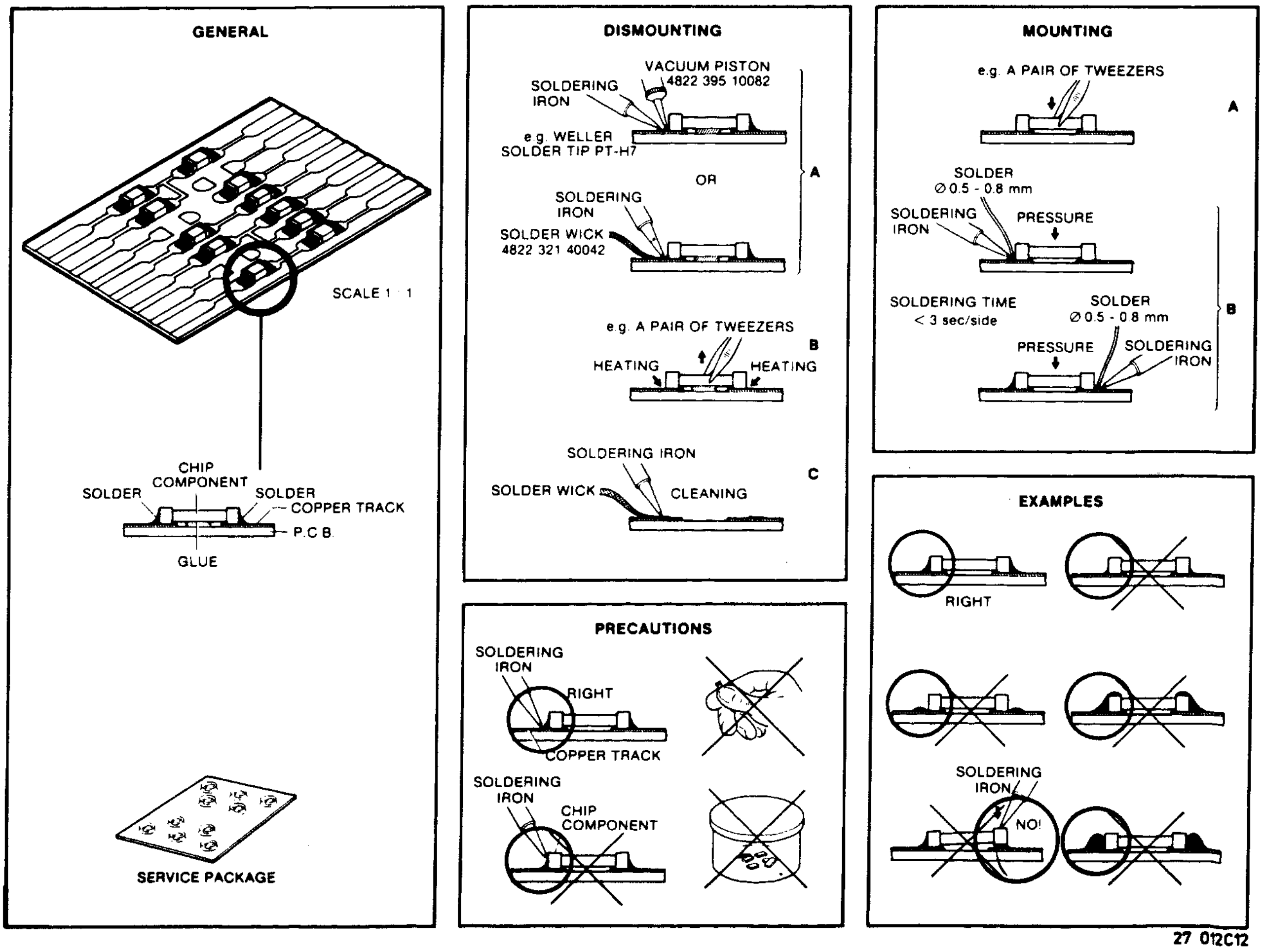
Compact Disc:

SBC426/426A Test disc 5 + 5A	4822 397 30096
SBC442 Audio Burn-in Test disc 1kHz	4822 397 30155
SBC429 Audio Signals disc	4822 397 30184
Dolby Pro-logic Test Disc	4822 395 10216

ESD Equipment:

Anti-static table mat - large 1200x650x1.25mm	4822 466 10953
Anti-static table mat - small 600x650x1.25mm	4822 466 10958
Anti-static wristband	4822 395 10223
Connector box (1MΩ)	4822 320 11307
Extension cable (to connect wristband to conn. box)	4822 320 11305
Connecting cable (to connect table mat to conn. box)	4822 320 11306
Earth cable (to connect product to mat or box)	4822 320 11308
Complete kit ESD3 (combining all above products)	4822 320 10671
Wristband tester	4822 344 13999

HANDLING CHIP COMPONENTS


GENERAL
SCALE 1 : 1
CHIP COMPONENT
SOLDER
SOLDER
COPPER TRACK
P.C.B.
GLUE
SERVICE PACKAGE
DISMOUNTING
VACUUM PISTON
4822 395 10082
SOLDERING IRON
e.g. WELLER SOLDER TIP PT-H7
OR
SOLDERING IRON
SOLDER WICK
4822 321 40042
A
e.g. A PAIR OF TWEEZERS
HEATING
HEATING
B
SOLDERING IRON
SOLDER WICK
CLEANING
C
MOUNTING
e.g. A PAIR OF TWEEZERS
A
SOLDER
∅ 0.5 - 0.8 mm
SOLDERING IRON
PRESSURE
SOLDERING TIME
< 3 sec/side
SOLDER
∅ 0.5 - 0.8 mm
PRESSURE
SOLDERING IRON
B
PRECAUTIONS
SOLDERING IRON
RIGHT
COPPER TRACK
SOLDERING IRON
CHIP COMPONENT
EXAMPLES
RIGHT
SOLDERING IRON
NO!
27 012C12

GENERAL INFORMATION

General Information

- ***The type plate (which contains the serial number) is located at the rear of the system.***
- ***Recording is permissible if copyright or other rights of third parties are not infringed.***

Environmental Information

All unnecessary packaging material has been omitted. We have done our utmost to make the packaging easily separable into three mono-materials: cardboard (box), polystyrene foam (buffer) and polythene (bags, protective foam sheet).

Your system consists of materials which can be recycled and reused if disassembled by a specialized company. Please observe the local regulations regarding the disposal of packaging materials, exhausted batteries and old equipment.

Acknowledgement

DOLBY B NR

The Dolby B NR System and the double-D symbol DD are trademarks of Dolby Laboratories Licensing Corporation. Manufactured under license from Dolby Laboratories Licensing Corporation.

Accessories *(Supplied)*

- Remote control
- Batteries (2 x AAA size) for remote control
- AM loop antenna
- FM antenna wire
- AC power cord
- 1 pair of surround speakers SS50 *(for model FW855 only)*

Accessories *(Recommended)*

- Philips FB 201 active subwoofer.
- Philips FB 202W wireless active subwoofer.

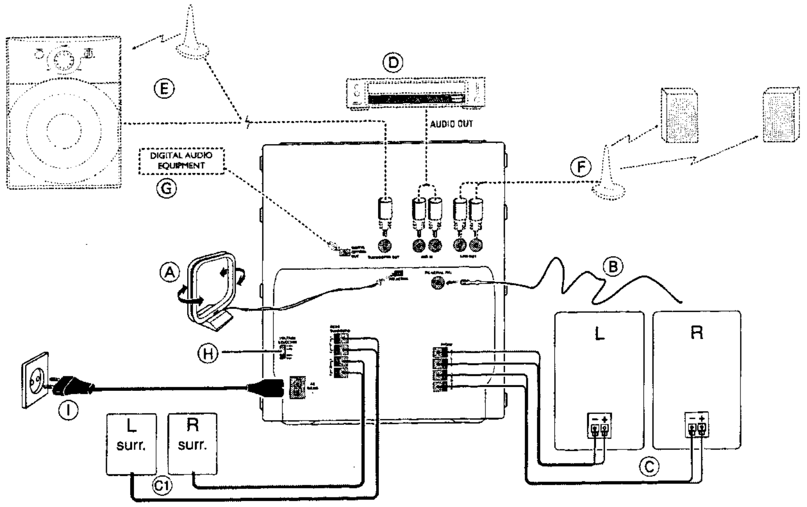
SAFETY INFORMATION

Safety Information

- Before operating the system, check that the operating voltage indicated on the type plate (or the voltage indication beside the voltage selector) of your system is identical with the voltage of your local power supply. If not, please consult your dealer. The type plate is located at the rear of your system.
- When the system is switched on, do not move it around.
- Place the system on a solid base (e.g. a cabinet).
- Place the system in a location with adequate ventilation to prevent internal heat build-up in your system.
- The system incorporates a built-in safety feature that prevents overheating.
- Do not expose the system to excessive moisture, rain, sand or heat sources.
- Under no circumstances should you repair the unit yourself, as this will invalidate the warranty!
- If the system is brought directly from a cold to a warm location, or is placed in a very damp room, moisture may condense on the lens of the CD unit inside the system. Should this occur, the CD player will not operate normally. Leave the power on for about one hour with no disc in the unit until normal playback is possible.
- Electrostatic discharge may cause unexpected problems. See whether these problems disappear if you unplug the AC power cord and plug it in again after a few seconds.
- **To disconnect the system from the power supply completely, remove the AC power plug from the wall socket.**

PREPARATION

Rear Connections



Ⓐ AM Antenna Connection

Connect the supplied loop antenna to the AM AERIAL terminal. Place the AM loop antenna far away from the system and adjust its position for the best reception.

Ⓑ FM Wire Antenna Connection

Connect the supplied FM wire antenna to the FM 75 Ω terminal. Adjust the position of the FM antenna for the best reception.

Outdoor Antenna
For better FM stereo reception connect an outdoor FM antenna to the FM AERIAL 75 Ω terminal using a 75 Ω coaxial wire.

Ⓒ Speakers Connections

- Connect the right speaker to Front terminal R, with the red wire to + and the black wire to –.
- Connect the left speaker to Front terminal L, with the red wire to + and the black wire to –.
- Clip the stripped portion of the speaker wire as shown.

(C1) Surround Speakers Connection

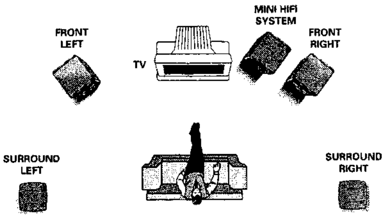
(for FW855C only)

4-Speakers Connection

- ***Front speakers :*** Connect the black wires to the black FRONT terminals and the red wires to the red FRONT terminals.
- ***Rear (surround) speakers :*** Connect the black or non-marked wires to the black REAR terminals and the white or marked wires to the grey REAR terminals.

Positioning the Speakers

To get the best surround sound effect, place the speakers as follow.


MINI HIFI SYSTEM
FRONT LEFT
FRONT RIGHT
TV
SURROUND LEFT
SURROUND RIGHT

Front Left and Right Speakers

For best listening effect, it is recommended to have the Left and Right speakers to form an angle of approximately 45 degrees to the listener. The speakers are magnetic shielded. Should the magnetic field from the speakers affect the picture of the television, you should increase the separation distance.

Rear (surround) Speakers

The surround speaker should be placed at normal listening ear level. It can also be mounted on the wall at the back of the room. Most important, sometimes you need to experiment creatively when placing the surround speakers in order to obtain the most ideal sound projection.

Ⓓ Connecting other equipment to your system

You can connect the audio left and right OUT terminals of a TV, VCR, Laser Disc or DVD player to the AUX IN terminals at the rear of the system.

Ⓔ Subwoofer Out Connection

You can connect either an optional active subwoofer (recommended Philips FB 201) or an optional wireless active subwoofer (recommended Philips FB 202W) to the SUBWOOFER OUT terminal. The wireless system uses a radio frequency transmitter. The subwoofer reproduces just the low bass effect (e.g. explosions, the rumble of the spaceships, etc.). Be sure to follow the instructions supplied with the subwoofer unit.

Ⓕ Line Out *(wireless ready)*

You may install additional front active speakers away from the system (e.g. in another room) to reduce the inconvenience of running long speaker wires across rooms. You can place as many remote speakers as you like provided that they operate at the same radio frequency. Connect the wireless radio frequency transmitter to the LINE OUT terminals. Place the active speakers at your preferred location. Be sure to follow the instructions supplied with the active speakers.

Ⓖ Digital Optical Out

You can record the digital sound from the CD, through this output, on any audio equipment with digital input (e.g. digital amplifier, Digital Audio Tape (DAT) deck, Digital to Analog Converter and Digital Signal Processor). Connect one end of the optical cable (not supplied) to the DIGITAL OPTICAL OUT socket and the other end to the audio equipment with digital input. When the DIGITAL OPTICAL OUT socket is not used, be sure to cover the socket with the supplied dust cap.

Ⓗ Adjusting the Operating Voltage

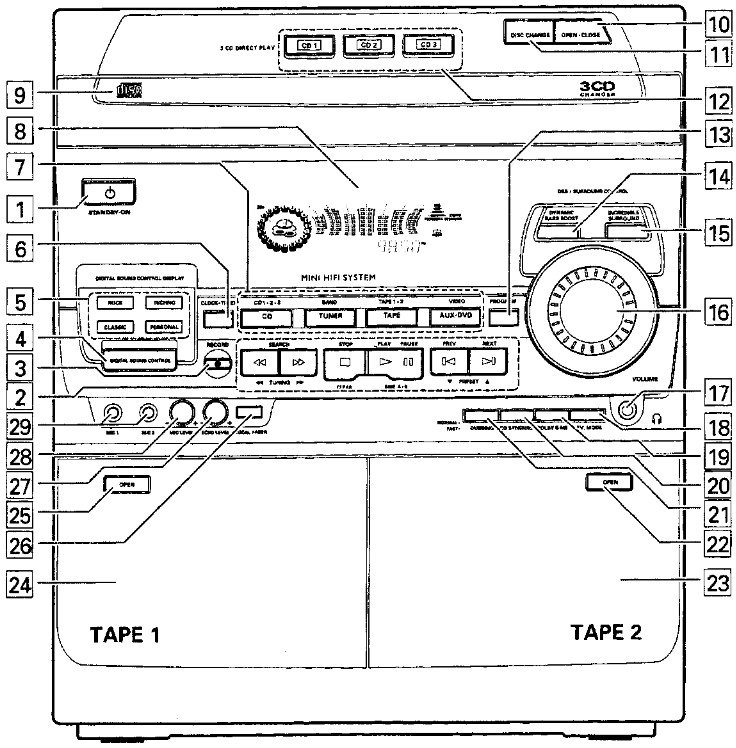
(not available for version /30)

Before connecting the AC power cord to the wall outlet, make sure that the voltage selector at the rear of the system is set to the local power line voltage. If not, reset the selector before connecting to the wall outlet.

Ⓘ AC Power Supply

After all other connections have been made, connect the AC power cord to the system and to the wall outlet.

CONTROLS


3 CD DIRECT PLAY
CD 1
CD 2
CD 3
3CD CHANGER
STANDBY-ON
MINI HIFI SYSTEM
DIGITAL SOUND CONTROL
ROCK
TECHNO
CLASSIC
PERSONAL
CD
TUNER
TAPE
AUX-DVD
RECORD
SEARCH
STOP
PLAY
PAUSE
PREV
NEXT
TUNING
PRESET
VOLUME
OPEN
TAPE 1
TAPE 2
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
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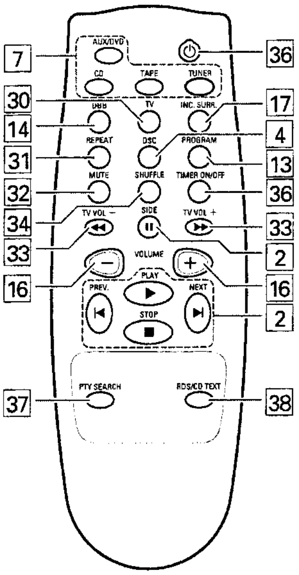

AUX/DVD
CD
TAPE
TUNER
DBB
TV
INC. SURR.
REPEAT
DSC
PROGRAM
MUTE
SHUFFLE
TIMER ON/OFF
TV VOL −
SIDE
TV VOL +
VOLUME
PLAY
PREV.
NEXT
STOP
PTY SEARCH
RDS/CD TEXT
7
30
14
31
32
34
33
16
37
36
17
4
13
36
33
2
16
2
38

Controls on the system and remote control

1 **STANDBY-ON**
– to switch the system on or to standby mode.

2 **MODE SELECTION**
SEARCH ◀◀ ▶▶ (TUNING ◀◀ ▶▶)
for CD .... to search backward/forward.
for TUNER ..... to tune to a lower or higher radio frequency.
for TAPE .... to rewind or fast forward the tape.
STOP ■ (CLEAR)
for CD .... to stop CD playback or clear a program.
for TUNER ..... to stop programming.
for TAPE .... to stop playback or recording.
PLAY PAUSE ▶ II (SIDE A•B)
for CD .... to start or interrupt playback.
for TAPE .... to start playback. When playing in tape 2 mode; to change side.
PREV I◀ / NEXT ▶I (PRESET ▲ ▼)
for CD .... to skip to the beginning of the current or previous/next track.
for TUNER ..... to select a preset radio station in memory.

3 **RECORD**
– to start recording on tape deck 2.

4 **DIGITAL SOUND CONTROL (DSC)**
– to select the desired sound effect : OPTIMAL, CLASSIC, ROCK, TECHNO, PERSONAL 1, PERSONAL 2 or PERSONAL 3.

5 **DIGITAL SOUND CONTROL DISPLAY PANEL**
– to view the selected DSC setting.

6 **CLOCK•TIMER**
– to view clock, set clock or timer.

7 **SOURCE** : to select the following.
CD / (CD 1•2•3)
– to select CD mode. When CD in stop mode; to select the respective disc tray.
TUNER / (BAND)
– to select Tuner mode. When in tuner mode; to select the waveband FM or MW.
TAPE / (TAPE 1•2)
– to select Tape mode. When tape in stop mode; to select either tape deck 1 or 2.
AUX•DVD / (VIDEO)
– to select external source (e.g. DVD, TV, Laser Disc or VCR sound).

8 **DISPLAY**
– to view the current setting of the system.

9 **CD CAROUSEL TRAY**

10 **OPEN•CLOSE**
– to open or close the CD carousel tray.

11 **DISC CHANGE**
– to change CD(s).

12 **3 CD DIRECT PLAY**
– to select a CD tray for playback.

13 **PROGRAM**
– to program CD track in CD mode or preset radio stations in tuner mode.

14 **DYNAMIC BASS BOOST (DBB)**
– to switch on bass boost to enhance bass response or to switch off bass boost.

15 **INCREDIBLE SURROUND**
– to switch on or off the surround sound effect.

16 **VOLUME**
– to adjust the volume level.

17 **HEADPHONES** 🎧
– to connect headphones jack.

18 **REVERSE MODE**
– to select the different play mode on tape deck 2 only.

19 **DOLBY B NR**
– to switch on or off the Dolby B NR mode.

20 **CD SYNCHRO**
– to synchronise the CD recording on a tape.

21 **DUBBING**
– to dub a tape in normal or high speed mode.

22 **OPEN**
– to open tape deck 2.

23 **TAPE DECK 2**

24 **TAPE DECK 1**

25 **OPEN**
– to open tape deck 1.

26 **VOCAL FADER** *(not available for version /30)*
– to fade out the vocal of the original song

27 **ECHO LEVEL** *(not available for version /30)*
– to adjust the echo level for karaoke or microphone recording.

28 **MIC LEVEL** *(not available for version /30)*
– to adjust the mixing level for karaoke or microphone recording.

29 **MIC 1 and 2** *(not available for version /30)*
– to connect microphones jack.

30 **TV** *(only on the remote control)*
– to select TV mode.

31 **REPEAT**
– to repeat a CD track.

32 **MUTE**
– to switch off the sound temporarily or to switch on again.

33 **TV VOLUME +/–** *(RC5 code only)*
– to adjust the volume of the television.

34 **SHUFFLE**
– to play all the available discs and their tracks in random order.

35 **TIMER ON/OFF**
– to switch on or off timer.

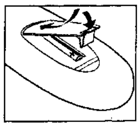
36 **⏻**
– to switch the system to standby mode.

37 **PTY SEARCH** – *not functional for this model.*

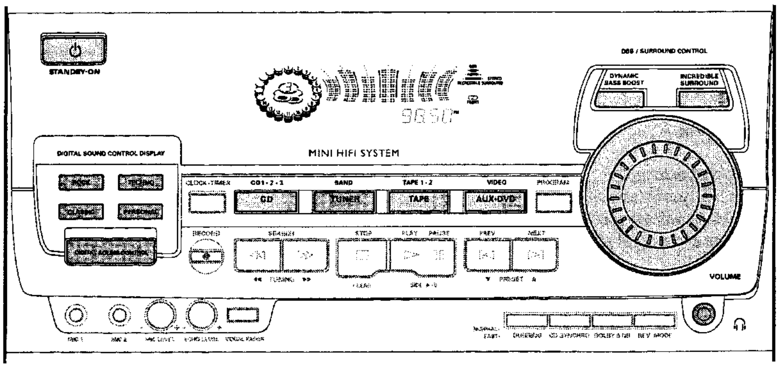
38 **CD TEXT** – *not functional for this model.*

Notes for remote control:
- *First select the source you wish to control by pressing one of the source select keys on the remote control (e.g. CD, TUNER, TAPE, AUX/DVD or TV).*
- *Then select the desired function (PLAY, NEXT, etc.).*

Inserting batteries into the Remote Control



- Insert the batteries (Type R03, UM4 or AAA) into the remote control as shown in the battery compartment.
- To avoid damage from possible battery leakage, remove dead batteries or batteries that will not be used for a long time. For replacement, use type R03, UM4 or AAA batteries.



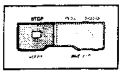
Important:
Before you begin operating the system, complete the preparation procedures.

Demonstration mode

The system has a demonstration mode that shows the various features offered by the system. ***Whenever the system is switched on from the wall socket, the demonstration mode will start automatically.***

Note:
- *During demonstration mode, if you press any source (or standby-on) button, the system will switch to the respective (or standby) mode.*
- *When the system is switched to standby mode, 5 seconds later, the demonstration mode will begin again.*

To cancel demonstration mode



- Press and hold **STOP ■** *(on the system only)* for ***3 seconds*** to stop the demonstration.
  → The demonstration mode will be switched off permanently.
  → The system will switch to standby mode.

Switching the system ON

- Press **STANDBY•ON** *(on the system only)*, **CD**, **TUNER**, **TAPE** or **AUX•DVD**.

You can also switch on the system by pressing any one of the 3 CD DIRECT PLAY buttons.

Switching the system to standby mode

- Press **STANDBY•ON** again.
  → The system will switch to standby mode.

Selecting the Source

- Press the respective source selection button: **CD**, **TUNER**, **TAPE** or **AUX•DVD**.
  → The display indicates the selected source.

Note:
- *For an external source, make sure that you have connected the audio left and right OUT terminals of the external equipment (TV, VCR, Laser Disc or DVD player) to the AUX IN terminals.*

Sound Control

Volume Adjustment

Rotate **VOLUME** right or left to increase or decrease the sound level.

For Personal Listening

Connect the headphones plug to the ☊ socket at the front of the system. The speakers will be muted.

Incredible Surround

Normal stereo sound is determined by the distance between the front speakers. When Incredible Surround is switched on, it magnifies the virtual distance between the front speakers for an incredibly wide, enveloping, stereo effect.

- Press **INCREDIBLE SURROUND** to switch on.
  → The INCREDIBLE SURROUND button lights up.
  → "INCREDIBLE SURROUND" will be displayed.

To switch off Incredible Surround

- Press **INCREDIBLE SURROUND** again.
  → The INCREDIBLE SURROUND button light is switched off.
  → "IS OFF" will be displayed.

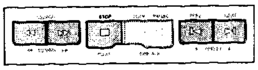
Digital Sound Control (DSC)

The DSC feature enables you to enjoy special sound effects that have preset equalizer settings, providing the best music reproduction.

- Press **DIGITAL SOUND CONTROL (DSC)** to select OPTIMAL, CLASSIC, ROCK, TECHNO or PERSONAL (1, 2, 3).
  → The Digital Sound Control display panel will light up respectively. At OPTIMAL setting, the DSC display panel does not light up.
  → "OPTIMAL, CLASSIC, ROCK, TECHNO, PERSONAL 1, PERSONAL 2 or PERSONAL 3" will be displayed.

Personal Setting allows you to store up to 3 preferred settings for bass and treble.

To set personal setting



1 Select Personal 1, 2, or 3.
2 Press and hold **DSC** button for 3 seconds.
  → The personal setting mode is switched on.
  → "ADJUST BASS AND TREBLE" will be displayed.
3 Press ◀◀ or ▶▶ to adjust the bass.
  → "BASS +XX or -XX" will be displayed.
4 Press ⏮ or ⏭ to adjust the treble.
  → "TREBLE +XX or -XX" will be displayed.
5 Press **DSC** again to confirm.

Note:
- *"XX" denotes the sound level.*

Automatic DSC-DBB selection

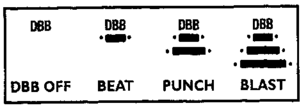
The best setting for the DBB is automatically generated for the respective DSC selection. You can also manually select the DBB setting that best suits your listening environment.

DSC Selection	DBB Selection
Optimal	Punch
Classic	Beat
Rock	Blast
Techno	Blast

Dynamic Bass Boost (DBB)

There are 3 settings for the DBB mode to enhance the bass response.

- Press **DBB** briefly to select the various level of bass boost.
  → The DBB button lights up.
  → "BEAT, PUNCH or BLAST" will be displayed.



To switch off DBB

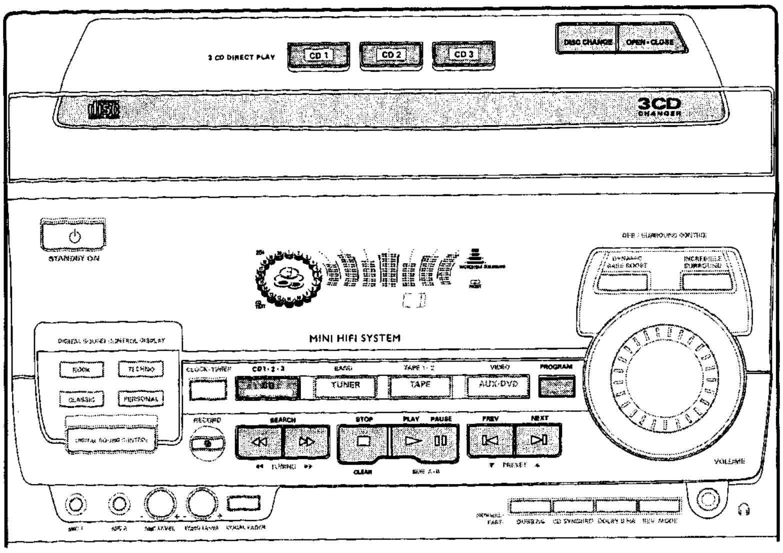
- Press **DBB** briefly until the DBB button light is switched off.
  → "DBB OFF" will be displayed.

Note:
- *Some CDs or tapes might be recorded in high modulation. It may cause a distortion at high volume. Should this occur, it is advisable to switch off Incredible Surround, select a lower DBB level or reduce the volume.*

Mute *(only on remote control)*

This feature allows you to temporarily switch off the sound of the system without switching off the system when you require a moment of silence.

- Press **MUTE** on the remote control to switch off the sound.
  → "MUTE" will be displayed.
- Press **MUTE** again on the remote control or increase the **VOLUME** level to switch on the sound.



Warning!
1) This system is designed for conventional CDs. Do not use any accessories like disc stabilizer rings or CD treatment sheets, etc., which may damage the CD mechanism.
2) Do not load more than one disc into each tray.
3) When the CD changer is loaded with CD(s), do not turn over or shake the system. This may jam the changer mechanism.

You can load up to three discs in the CD changer for continuous playback without interruption.

Loading the CD Changer

1 Press **CD** to select CD mode.
2 Press **OPEN•CLOSE**.
  → The CD compartment slides out.
3 Load a CD with the printed side up in the right tray.
- You can load another disc in the left tray.
- To load the third disc, press the **DISC CHANGE** button.
  → The CD changer carousel will rotate until the empty tray is at the right hand side and is ready for loading.
  → Playback will always start with the disc in the outer right disc tray.

4 Press **OPEN•CLOSE** to close the CD compartment.
  → The total number of tracks and playing time of the last selected disc appear on the display.

3 CD Direct Play

You can play a CD directly by pressing the **3 CD DIRECT PLAY (1 - 3)** buttons. The CD player will stop at the end of playback of the selected disc.

- When the button is green, it indicates that there is no disc loaded in the disc tray.
- When the button is red, it indicates that there is a disc loaded in the disc tray.

Playing a CD

1 Press **PLAY** ▶ to start playback.
  → The disc tray, track number and elapsed playing time of the current track appear on the display.
  → The current track number will also be flashing on the circular music calendar.
  → When a track has been played, the track number will be erased from the circular music calendar.
- To interrupt playback, press **PAUSE ❚❚**.
  → The playing time flashes.
- To resume playback, press **PLAY** ▶ again.

2 To stop playback, press **STOP** ■.

Note:
- *All the available discs will be played once, then stop. When the CD has stopped playing, the system will switch to the standby mode after 15 minutes if no button is pressed.*

Disc Change

You can change the outer 2 discs while the third inner disc is at the stop or playing mode.

1 Press **DISC CHANGE**.
  → The CD compartment slides out.
2 Replace the discs in the left and right disc trays.
- If you press **DISC CHANGE** again during playback, the CD will stop playing.
  → The CD carousel will rotate until the inner tray is at the right hand side and is ready for changing.

3 Press **OPEN•CLOSE** to close the CD compartment.

Selecting a desired track

Selecting a desired track at the stop mode

1 Press **PREV** |◀ or **NEXT** ▶| until the desired track appears on the display.
2 Press **PLAY** ▶ to start playback.
  → The selected track number and elapsed playing time appear on the display.

Selecting a desired track during playback

1 Press **PREV** |◀ or **NEXT** ▶| until the desired track appears on the display.
  → The selected track number and elapsed playing time appear on the display.
- If you press **PREV** |◀ once it will skip to the beginning of the current track and play the track again.

Searching for a particular passage during playback

- Press and hold ◀◀ or ▶▶ until the desired passage is located.
  → The volume will be reduced.
- Play returns to normal when ◀◀ or ▶▶ is released.

Programming Tracks

Programming tracks of a loaded CD is only possible in the stop mode. The display will indicate the total tracks stored in the program. Up to 40 tracks can be stored in the memory in any order. When 40 tracks are stored and you attempt to store another track, the display will show "PROGRAM FULL".

1 Load the desired discs in the disc trays.
2 Press **PROGRAM** to start programming.
  → The PROGRAM flag starts flashing.
3 Press the **CD (CD 1•2•3)** button to select the disc.
4 Press **PREV** |◀ or **NEXT** ▶| to select the desired track.
5 Press **PROGRAM** to store the track.
- Repeat steps *3* to *5* to store other discs and tracks.

6 Press **STOP** ■ once to end programming mode.
  → The total number of tracks programmed and total playing time appear on the display.

Notes:
- *If the total playing time is more than "99:59" or if one of the programmed tracks has a number greater than 30, then "- - : - -" appears in the display instead of the total playing time.*
- *During programming, if no button is pressed within 20 seconds, the system will exit program mode automatically.*

Playing the program

1 Press **PLAY** ▶ to start program playback.
  → "PLAY PROGRAM" appears on the display.
  → The track number and elapsed playing time of the current track will appear on the display.
- If you press **REPEAT** during program playback, the current track will be played repeatedly.
  → The REPEAT and PROGRAM flags will be displayed.

2 Press **STOP** ■ to stop program playback.

Note:
- *If you press any of the 3 CD DIRECT PLAY buttons, the system will play the selected disc or track and the stored program will be ignored temporarily. The PROGRAM flag will also temporary disappear from the display and then reappear, when the playback for the selected disc ends.*

Reviewing the program

Reviewing of the program is only possible in the stop mode.

- Press **PREV** |◀ or **NEXT** ▶| repeatedly to review the programmed tracks.
- Press **STOP** ■ to exit review mode.

Erasing the program *(in the stop mode)*

- Press **CLEAR** on the system.
  → "PROGRAM CLEARED" will be displayed.

Note:
- *The program is also erased when the system is disconnected from the power supply. If the CD carousel is opened, the tracks belonging to the outer two trays will be erased and the display will show "CLEARED".*

Shuffle *(only on remote control)*

It will play all the available discs and their tracks in random order. Shuffle can also be used when tracks are programmed.

To shuffle all the discs and tracks

1 Press **SHUFFLE**.
  → "SHUFFLE" will be displayed.
  → The SHUFFLE flag, the disc and the track selected at random appear on the display.
- The discs and the tracks will now be played in random order until you press **STOP** ■.
- If you press **REPEAT** during shuffling, the current track will be played repeatedly.
  → The REPEAT and SHUFFLE flags will be displayed.

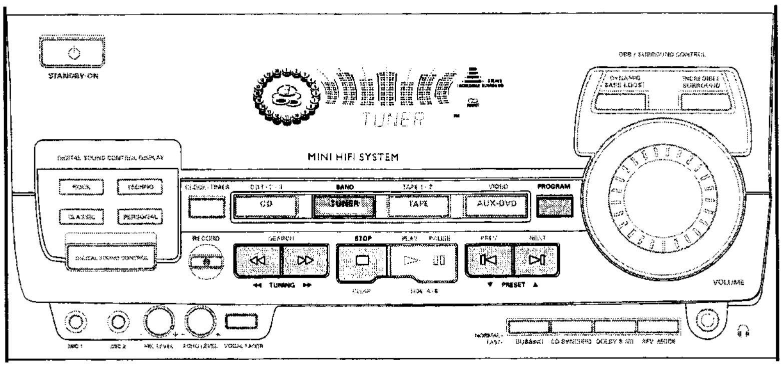
2 Press **SHUFFLE** again to resume normal playback.
  → The SHUFFLE flag disappears from the display.

Repeat *(only on remote control)*

It will play the current track repeatedly.

1 Press **REPEAT** during CD playback.
  → "REPEAT TRACK" will be displayed.
  → The REPEAT flag appears on the display.
- The track will be played repeatedly until you press **STOP** ■.

2 Press **REPEAT** again to resume normal playback.
  → The REPEAT flag disappears from the display.


STANDBY·ON
TUNER
DBB / SURROUND CONTROL
DYNAMIC BASS BOOST
INCREDIBLE SURROUND
MINI HIFI SYSTEM
DIGITAL SOUND CONTROL DISPLAY
ROCK
TECHNO
CLASSIC
PERSONAL
DIGITAL SOUND CONTROL
CLOCK·TIMER
CD 1·2·3
BAND
TAPE 1·2
VIDEO
PROGRAM
CD
TUNER
TAPE
AUX-DVD
RECORD
SEARCH
STOP
PLAY
PAUSE
PREV
NEXT
◄◄ TUNING ►►
CLEAR
SIDE A·B
▼ PRESET ▲
VOLUME
MIC 1
MIC 2
MIC LEVEL
ECHO LEVEL
VOCAL FADER
NORMAL· FAST
DUBBING
CD SYNCHRO
DOLBY B NR
REV. MODE

Tuning to radio stations

1 Press **TUNER** to select TUNER mode.
   → "TUNER" will be displayed.
   A few seconds later, the current frequency or the radio station name if available will be displayed.
2 Press **TUNER** (BAND) again to select the desired waveband : FM or MW.
3 Press **TUNING ◄◄** or **►►** for more than one second, then release.
   → The display will show 'SEARCH' until a station with sufficient signal strength is found.

- Repeat this procedure until the desired station is reached.
- To tune to a weak station, briefly press **TUNING ◄◄** or **►►** until the display shows the desired frequency and/or when the best reception has been obtained.

Storing Preset Stations

You can store up to 40 stations in the memory. When a preset radio station is selected, the preset number appears next to the frequency on the display.

Automatic programming

1 Press **TUNER**.
2 Press **TUNER** (BAND) again to select the desired waveband : FM or MW.
3 Press **PROGRAM** for more than one second.
   → PROGRAM flag starts flashing and 'AUTO' will be displayed.
   → Every available radio station for the selected waveband will be stored automatically. The frequency and preset number will be displayed briefly.
   → The system will stop searching when all the available radio stations are stored or when the memory for 40 preset radio stations is used.
   → The system will remain tuned to the last stored preset radio station.

- Repeat the above procedure to store other preset stations for the other waveband. Remember to select the next available preset number before proceeding. If not, some of the preset radio stations may be erased.

Notes:
- *You can cancel the automatic programming by pressing PROGRAM or STOP ■ (on the system only).*
- *If you want to reserve a section of preset numbers, for example preset numbers 1 to 9, select preset 10 before starting automatic programming: now only the preset numbers 10 to 40 will be programmed.*

Manual programming

1 Press **TUNER**.
2 Press **TUNER** (BAND) to select the desired waveband : FM or MW.
3 Press **PROGRAM** for less than one second.
   → The PROGRAM flag starts flashing.
   → The next available preset number will be displayed for selection.
4 Press **TUNING ◄◄** or **►►** to tune to the desired frequency.

- If you wish to store the radio station to another preset number, press **PRESET ▼** or **▲** to select the desired preset number.

5 Press **PROGRAM** again.
   → PROGRAM flag will stop flashing, and the station will be stored.

- Repeat the above procedure to store other preset stations.

Notes:
- *Press STOP ■ (on the system only) to cancel programming.*
- *During programming, if no button is pressed within 20 seconds, the system will exit program mode automatically.*

Tuning to Preset Radio Stations

- Press **PRESET ▼** or **▲** to select the desired preset number.
   → The preset number, frequency and waveband appear on the display

Changing the MW tuning grid

(not available for version /30)

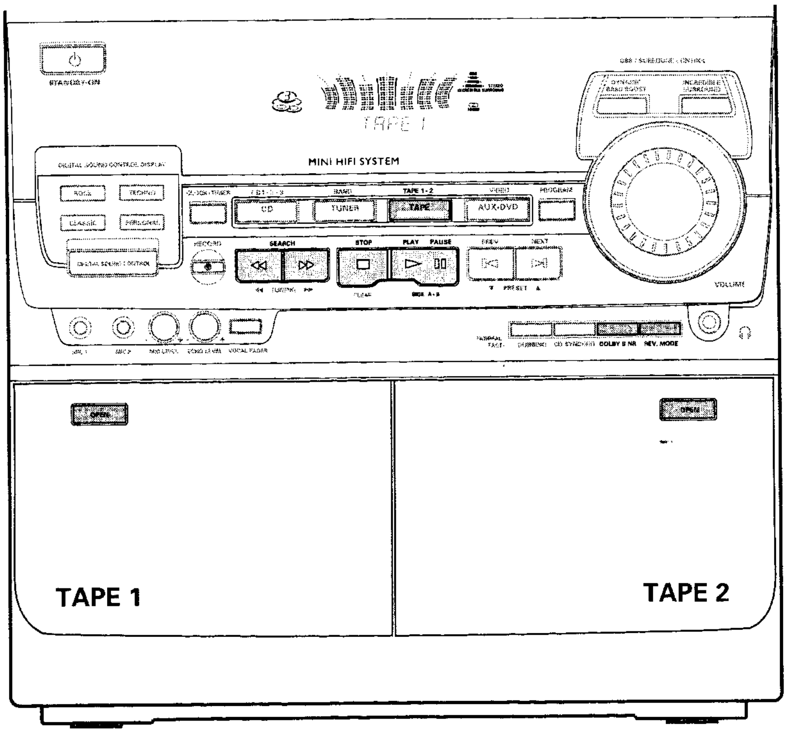
The frequency step can be changed if necessary. In North and South America, the frequency step between adjacent channels in the MW band is 10 kHz. In other parts of the world, it is 9 kHz. The frequency step preset in the factory is 9 KHz.

For MW Band
To change from 9 kHz to 10 kHz or vice versa

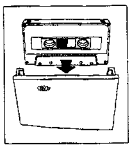
Changing of tuning grid will erase all previously stored preset stations.

1 Disconnect the system from the AC power supply *(pull out the AC power cord).*
2 Press and hold **TUNER** and **TUNING ►►** while reconnecting the system to the AC power supply.
   → Display will show "GRID 10" or "GRID 9".

Notes:
- *GRID 9 indicates that the tuning grid is in step of 9 kHz in MW band. GRID 10 indicates that the tuning grid is in step of 10 kHz in MW band.*
- *FM tuning grid will also be changed from 50 kHz to 100 kHz or vice versa. All preset stations will also be erased.*



Loading a tape



- Press **OPEN**.
- The tape deck door opens.
- Load the tape with the open side downward and the full spool to the left.
- Close the tape deck door.

Tape Playback

1 Press **TAPE** to select TAPE mode.
→ "TAPE 1" or "TAPE 2" will be displayed.
- Press **TAPE** again to select either tape deck 1 or tape deck 2.

2 Load the tape into the selected tape deck.
3 Press **PLAY** ▶ to start playback.
3a *(For Tape Deck 2 only)*
Press **SIDE A•B** to switch playback between sides A and B.
→ The FRONT or BACK flag appears in the display, depending on the side selected.
3b *(For Tape Deck 2 only)*
Press **REV MODE** to select the different type of play mode *(see auto reverse playback)*.
4 Press **STOP** ■ to end playback.

Notes:
- *To change side before playback begins, use the SIDE button on the remote control.*
- *When the tape has stopped playing, the system will switch to the standby mode automatically after 15 minutes if no button is pressed.*

Auto Reverse Playback *(only on tape deck 2)*

- Press **REV MODE** to select the different play modes.

⊐ .... recording or playback on one side of the tape. The tape stops at the end of one side.
⊃ .... recording or playback on both sides of the tape. The tape then stops.
⊂⊃ .... continuous playback on both sides of the tape up to a maximum of 20 times per side unless you press **STOP** ■.

Rewind/Fast Forward

At the stop mode

1 You can rewind or fast forward the tape by pressing ◀◀ or ▶▶ respectively.
→ "TAPE 1 XXX" or "TAPE 2 XXX" will be displayed, depending on which tape deck is selected.
→ The tape will stop automatically at the end of rewinding or fast forwarding.
2 Press **STOP** ■ to stop rewind or fast forward.

During playback

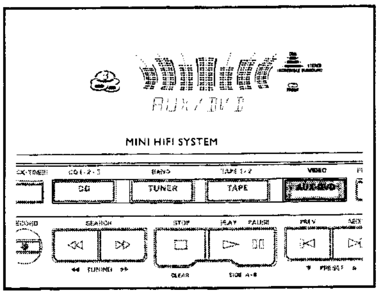
- Press and hold ◀◀ or ▶▶ respectively until the desired passage is located.
  → During searching, the sound is reduced to a low volume.
  → When you release ◀◀ or ▶▶, the tape continues playing.

Notes:
- *During rewinding or fast forwarding a tape; it is possible to select another source (e.g. CD, TUNER or AUX•DVD). "XXX" denotes the counter number.*
- *Check and tighten slack tape before use with a pencil. Slack tape may get jammed or may burst in the mechanism.*
- *C-120 tape is extremely thin and is easily deformed or damaged. It is not recommended for use in this system.*
- *Store the tapes at room temperature and do not put them too close to a magnetic field (for example, transformer, TV or loudspeaker boxes).*

Dolby B Noise Reduction System

1 Press **DOLBY B NR** to switch on Dolby B NR.
→ The DD B NR appears in the display.
2 Press **DOLBY B NR** again to switch off Dolby B NR.
→ The DD B NR disappears from the display.

Note:
- *A tape recorded with the Dolby B NR system should also be played in the Dolby B NR mode. If you forget to operate the DOLBY NR button, the treble may be reproduced too strongly.*

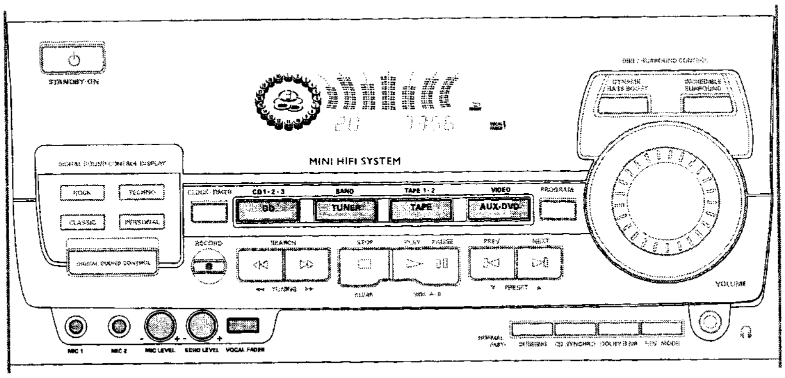


Selecting External Equipment

If you have connected the audio out terminals of the external equipment (TV, VCR, Laser Disc or DVD player) to the AUX IN terminals, you can hear the sound from the system.

- Press **AUX•DVD** to select the external mode.
  → "AUX/DVD" will be displayed.

Note:
- *All the sound control features (e.g. DSC, DBB, etc.) are available for selection.*

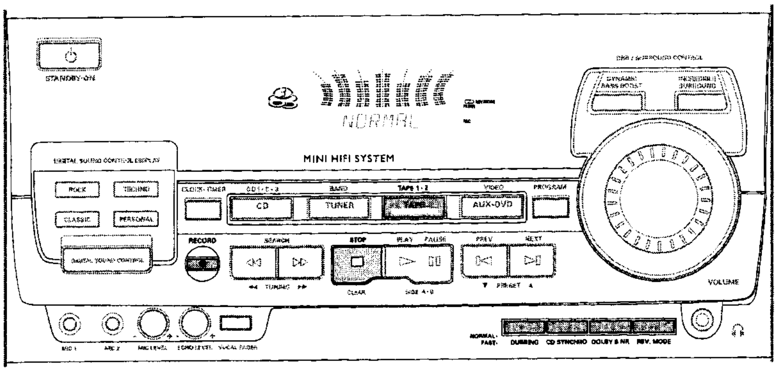

STANDBY-ON
MINI HIFI SYSTEM
CD 1·2·3
BAND
TAPE 1·2
VIDEO
PROGRAM
CD
TUNER
TAPE
AUX·DVD
RECORD
SEARCH
STOP
PLAY PAUSE
PREV
NEXT
VOLUME
MIC 1
MIC 2
MIC LEVEL
ECHO LEVEL
VOCAL FADER

Karaoke *(not available for version /30)*

Microphone mixing

1. Set the **MIC LEVEL** control to the minimum level to prevent acoustic feedback (e.g. a loud howling sound) before you connect the microphone.
2. Connect either 1 or 2 microphones to the **MIC 1** or **MIC 2** socket.
3. Press **CD**, **TUNER**, **TAPE 1** or **AUX•DVD**.
4. Play the selected source.
5. Adjust the volume level with **VOLUME** control.
6. Adjust the **MIC LEVEL** control to the mixing level that you want.
7. Adjust the **ECHO LEVEL** control to the echo level that you want.
8. Press **VOCAL FADER** to suppress the vocals on special recorded Karaoke CDs.
   → When the VOCAL FADER is switched on, the VOCAL FADER flag and " 🎤 " will be displayed.
9. Start singing or talking through the microphone.

Note:
- *For maximum VOCAL FADER effect, you are advised to switch off the Incredible Surround.*


STANDBY-ON
NORMAL
MINI HIFI SYSTEM
CD
TUNER
TAPE
AUX·DVD
RECORD
SEARCH
STOP
PLAY PAUSE
PREV
NEXT
VOLUME
MIC 1
MIC 2
MIC LEVEL
ECHO LEVEL
VOCAL FADER

Notes:
- *If you do not intend to record via the microphone, unplug the microphone to avoid accidental mixing with other recording source.*
- *For recording, use only tape of IEC type I (normal tape) or IEC type II (Chrome).*
- *The tape is secured at both ends with leader tape. At the beginning and end of tape, nothing will be recorded for six to seven seconds.*
- *The recording level is set automatically, regardless of the position of VOLUME, DBB or Incredible Surround. Dolby B NR can be selected for Tuner or CD recording.*
- *To prevent accidental recording, break out the tab on the left shoulder of the tape side you want to protect.*
- *If "CHECK TAPE" is displayed, the protection tab has been broken. Put a piece of clear adhesive tape over the opening. Do not cover the CrO_2 tape detection hole when covering the tab opening.*

Recording the mixed sound / One Touch Recording

- During microphone mixing, you can record the mixed sound on a tape in tape deck 2 except dubbing mode.
- For One Touch Recording, as soon as you press RECORD, the current source (CD, TUNER, TAPE 1 or AUX•DVD) will be recorded on tape deck 2

1. Load a blank tape in tape deck 2.
2. Press **RECORD ●**.
   → The REC flag is displayed.
3. Press **STOP ■** to stop recording.

Note:
- *When you press RECORD at TAPE 2 mode, "SELECT SOURCE" will be displayed. One Touch Recording is not possible at TAPE 2 mode.*

Recording from other sources *(only on tape deck 2)*

1. Press **TAPE** to select tape deck 2 .
2. Load a blank tape into tape deck 2 with the open side downward.
3. Press **SIDE** on the remote control to select the recording side.
   → The FRONT or BACK flag will be displayed, depending on the side selected.
4. Press **REV MODE** to select the playback mode (⇄ or ⟲).
5. Press **DOLBY NR** to record with Dolby NR *(except TAPE 1 mode)*.
6. Press **CD**, **TUNER**, **TAPE 1** or **AUX•DVD**.
   - Start playback of the selected source.
7. Press **RECORD ●** to start recording.
   → The REC flag is displayed.
8. Press **STOP ■** to stop recording.

Notes:
- *Only ⇄ or ⟲ mode is available during recording.*
- *During recording, it is not possible to listen to another sound source.*

Dubbing tapes *(from tape deck 1 to tape deck 2)*

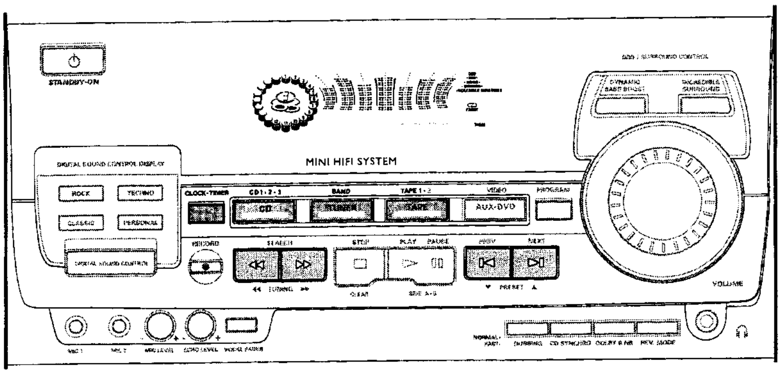
1. Press **TAPE** to select tape deck 2 .
2. Load the prerecorded tape into tape deck 1 and a blank tape into tape deck 2.
3. Press **SIDE** on the remote control to change the desired direction of the play mode.
   → The FRONT or BACK flag will be displayed, depending on the side selected.
4. Press **REV MODE** to select the play mode (⊐) for tape deck 2.
5. Press **DUBBING** ***once*** for normal speed dubbing or ***twice*** for high speed dubbing.
   → Both the tapes in deck 1 and 2 will start rewinding to the front automatically.
   → Dubbing will start immediately after both tapes have finished rewinding.
   → "NORMAL XXX" (normal speed) or "FAST XXX" (high speed) will be displayed.
   → HSD appears on the display for high speed dubbing.
   → The REC flag is displayed.
6. Press **STOP ■** to stop dubbing.

Notes:
- *"XXX" denotes the counter number.*
- *Only ⊐ mode is available during dubbing.*
- *At the end of side A, flip the tapes to side B and repeat the procedure.*
- *Dubbing of tapes is only possible from tape deck 1 to tape deck 2.*
- *To ensure good dubbing, use tapes of the same length.*
- *During high speed dubbing in Tape mode, the sound is reduced to a low volume.*
- *You can switch to other sound source while dubbing.*
- *Dolby NR button has no influence during dubbing (dubbing from tape deck 1 to tape deck 2). An original tape recorded with Dolby B NR automatically produces a copy with Dolby B NR.*

CD Synchro Start Recording

During CD synchro start recording,
- It is not advisable to fast forward/rewind your tape in tape deck 1.
- It is not possible to listen to another source.

1. Press **CD**.
2. Load a disc into the disc tray.
3. You can program the tracks in the order you want them to be recorded (see Programming Tracks). If not, the tracks are recorded according to the selected disc.
4. Press **TAPE** to select tape deck 2.
5. Load a blank tape (full spool to the left) into tape deck 2.
6. Press **SIDE** on the remote control to change the desired direction of the play mode.
   → The FRONT or BACK flag will be displayed, depending on the side selected.
7. Press **REV MODE** to select the play mode (⊐ or ⊃) for tape deck 2.
8. Press **DOLBY NR** to to record with Dolby NR.
9. Press **CD SYNCHRO** to start recording.
   → The REC flag is displayed.
   → After about seven seconds, the CD will start playing. This is to prevent recording on the leader tape at the beginning of the tape.
10. Press **STOP ■** to stop recording CD playback.



View Clock

You can view the clock (if it is set) at standby or any source. It will be displayed for about seven seconds.

- Press **CLOCK•TIMER** briefly.
  → " 10:25" (the current time) will be displayed.
  → "--:--" will be displayed if the clock is not set.

Clock Setting

The clock is set in 24-hour mode, e.g. "00:00" or "23:59". Before setting the clock, you must be in the View Clock mode.

1. Press **CLOCK•TIMER** to select clock mode.
   → "00:00" or the current time starts flashing.
2. Set the hour with ◀◀ or ▶▶.
3. Set the minute with |◀ or ▶|.
4. Press **CLOCK•TIMER** again to store the setting.
   → The clock starts running.

- To exit without storing the setting, press **STOP ■**.

Notes:
- *During clock setting, if no button is pressed within 90 seconds, the system will exit clock setting mode automatically.*
- *When a power interruption occurs, the clock setting is erased.*

Timer Setting

- The system can switch on to CD, TUNER or TAPE 1 mode automatically at a preset time. It can serve as an alarm to wake you up. After half an hour from the preset time, the system will return to the standby mode if no button is pressed.
- Before setting the timer, make sure the clock is set correctly.
- The timer has to be reset or start again for each subsequent preset time.
- **The volume of the timer will be at the last setting before the set is switched to standby mode.**

1. Press and hold **CLOCK•TIMER** for more than 2 seconds to select timer mode.
   → "ON 00:00" or the last set timer starts flashing.
   → The TIMER flag will be flashing.
   → The last selected timer source will be lighted in green while the other available sources are flashing.
2. Press **CD, TUNER** or **TAPE 1** to select the desired source.
   → The selected timer source will be lighted in green.
3. Press ◀◀ or ▶▶ to set the hour for the timer to start.
4. Press |◀ or ▶| to set the minute for the timer to start.
5. Press **CLOCK•TIMER** to store the start time and the selected source.
   → The TIMER is now set.
   → The TIMER flag remains on the display.

- To exit without storing the setting, press **STOP ■**.

TIMER

- At the preset time, the TIMER will be activated.
  → The selected source will be played.
  → The TIMER flag disappears from the display.

To stop the TIMER

- Press **TIMER ON/OFF** on the remote control.
  → The TIMER is now switched off.
  → The TIMER flag disappears.

To start the TIMER again *(for the same time)*

- Press **TIMER ON/OFF** on the remote control.
  → The TIMER flag is displayed.

Notes:

- *During timer setting, if no button is pressed within 90 seconds, the system will exit timer setting mode automatically.*
- *If the source selected is TUNER, the last tuned frequency will be switched on.*
- *If the source selected is CD, playback will begin with the first track of the last selected disc. If the CD trays are empty, the TUNER will be selected instead.*
- *If the source selected is TAPE 1, and if the preset time is reached during high speed dubbing, the TUNER source will be selected instead.*

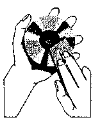
MAINTENANCE

Maintenance

Cleaning the Cabinet

- Use a soft cloth slightly moistened with a mild detergent solution. Do not use a solution containing alcohol, spirits, ammonia or abrasives.

Cleaning Discs



- When a disc becomes dirty, clean it with a cleaning cloth. Wipe the disc from the center out.
- Do not use solvents such as benzine, thinner, commercially available cleaners, or antistatic spray intended for analog records.

Cleaning the CD lens

After prolonged usage, dirt or dust may accumulate at the CD lens. To ensure good playback quality, clean the CD lens with Philips CD Lens Cleaner or any commercially available. Follow the instructions supplied with the Lens Cleaner.

Cleaning the Heads and the Tape Paths

- To ensure good recording and playback quality, clean the heads, the capstan(s), and pressure roller(s) after every 50 hours of tape operation.
- Use a cotton swab slightly moistened with cleaning fluid or alcohol.
- You can also clean the heads by playing a cleaning tape through once.

Demagnetizing the heads

- Use a demagnetizing tape available at your dealer.

TROUBLESHOOTING

Warning! Under no circumstances should you try to repair the system yourself, as this will invalidate the warranty.

- If a fault occurs, check the points listed below before taking the system for repair.
- Should any problems persist after you have made these checks, consult your nearest dealer or service center.

CD Player Operation

"NO DISC" is displayed.

- The disc is inserted upside down.
- → *Place CD with printed side up.*
- Moisture condensation at the lens.
- → *Wait until lens has adjusted to normal room temperature.*
- There is no disc in the CD tray.
- → *Insert a CD.*
- The CD is dirty, badly scratched or warped.
- → *Clean or replace the CD.*
- The CD lens is dirty or dusty.
- → *See section under Maintenance.*

Radio Reception

Poor radio reception

- The signal strength is too weak.
- → *Adjust the antenna.*
- The TV or VCR is too close to the stereo system.
- → *Separate the stereo system from the TV or VCR.*
- → *Connect an external antenna for better reception.*

Tape Deck Operation

"RECORDING ACTIVE" is displayed.

- A recording is in progress.
- → *Stop the recording or wait until it is finished.*

"TAPE DUBBING ONLY" is displayed.

- Tape dubbing is only possible in tape mode.
- → *Switch source to tape mode.*

Recording or playback cannot be made or there is a decrease in audio level.

- *Dirty tape heads, capstans or pressure rollers.*
- → *See section on tape deck maintenance.*
- Magnetic build-up in the record/playback head.
- → *Use demagnetizing tape.*

General

System switches to standby mode automatically

- The system is operating in an extremely hot environment or internal heat build-up is high.
- → *This is not a malfunction. The system incorporates a built-in safety feature that prevents overheating.*
- → *Let the system cools down, then switch on again.*

System does not react when any button is pressed.

- Electrostatic discharge.
- → *Press STANDBY-ON to switch the unit off; Remove the AC power plug from the wall outlet, then reconnect and switch on the system again.*

No or poor sound.

- Volume is not turned up.
- → *Adjust VOLUME.*
- The headphones are connected.
- → *Disconnect the headphones.*
- Speakers are not connected or are connected wrongly.
- → *Check that the speakers are connected correctly.*
- → *Make sure that the stripped speaker wire is clamped.*

Reversed left and right sound.

- Speakers are incorrectly connected.
- → *Check the speaker connections and location.*

Lack of bass sound or apparently imprecise physical location of musical instruments.

- Speakers are incorrectly connected.
- → *Check the speaker connection for proper phasing, red/black wires to red/black terminals.*

Remote control has no effect on the system.

- The distance to the system is too large.
- → *Reduce the distance.*
- Batteries are inserted incorrectly.
- → *Insert the batteries with their polarities (+/– signs) as indicated..*
- Batteries are exhausted.
- → *Replace the batteries.*
- Wrong source is selected.
- → *Select the source (CD, TUNER, etc.) before pressing the function button, (PLAY, PREV/NEXT, etc.).*

Timer not working.

- Timer is not switched on.
- → *Press TIMER ON/OFF on remote control to switch on the timer.*
- Dubbing/recording is in progress.
- → *Stop dubbing/recording.*

System display features automatically and buttons flashing continuously.

- Demonstration mode is switched on.
- → *Press and hold STOP ■ for 3 seconds to switch off the demo.*

"UNPLUG HEADPHONE" is displayed.

- Headphones is connected.
- → *Disconnect the headphones.*

ADDITIONAL FEATURES FOR EUROPEAN VERSIONS

CD Text

It will enable you to know which album and its track you are selecting or playing on specially encoded CD.

- Press **RDS•CD TEXT**.
  At stop mode
  → The title of album or total playing time will be displayed.
  During Playback
  → The title of album, track title or elapsed time will be displayed.
- If the album and track title are not known.
  → "NO TEXT ON DISC" will be displayed.

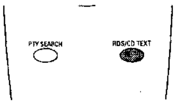
Receiving RDS Radio Station

RDS (Radio Data System) is a broadcasting service that allows FM stations to send additional information along with the regular FM radio signal. This additional information can contain:

- **STATION NAME:** The station name is displayed.
- **FREQUENCY:** The frequency of the station is displayed.
- **PROGRAM TYPE:** The following program types exist and can be received by your tuner: News, Affairs, Info, Sport, Educate, Drama, Culture, Science, Varied, Pop M, Rock M, M.O.R. (middle of the road music), Light M, Classics, Other M, No type.
- **RADIO TEXT (RT):** text messages appear in the display.

When you have tuned to a RDS station, the RDS logo () and the station name will appear on the display:

- The display normally shows the radio station name if available.
  By repeatedly pressing **RDS•CD TEXT** button you can change the type of display information:
  → The display shows in turn:
  STATION NAME
  → PROGRAM TYPE → RADIO TEXT → FREQUENCY → STATION NAME ...



Note:

– *When you press the RDS•CD TEXT button and the display shows "NO RDS", it indicates that either the tuned station is not transmitting RDS signal or it is a non RDS station.*

RDS Clock

Some RDS station may be transmitting a real clock time at an interval of every minute.

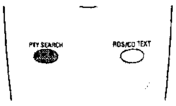
Setting the time with RDS clock

1 Press **CLOCK•TIMER**.
  → "-- : --" or current time appears on the display.
2 Press **CLOCK•TIMER** once more to enter clock setting mode.
  → "00:00" or current time starts flashing.
3 Press **RDS•CD TEXT**.
  → The message "SEARCH RDS TIME" will be displayed.
  → If the station does not transmit RDS clock, "NO RDS TIME" will be displayed.
  → When the RDS clock is read, "RDS TIME" will be displayed. The current clock time is displayed for 2 seconds and will be stored automatically.
  → If within 90 seconds, the RDS time is not detected, "NO RDS TIME" will be displayed.

Program Type *(only on remote control)*

You can activate the PROGRAM TYPE function only in the Tuner mode. Once the program type is detected in a RDS station, it will switch to the radio station automatically.

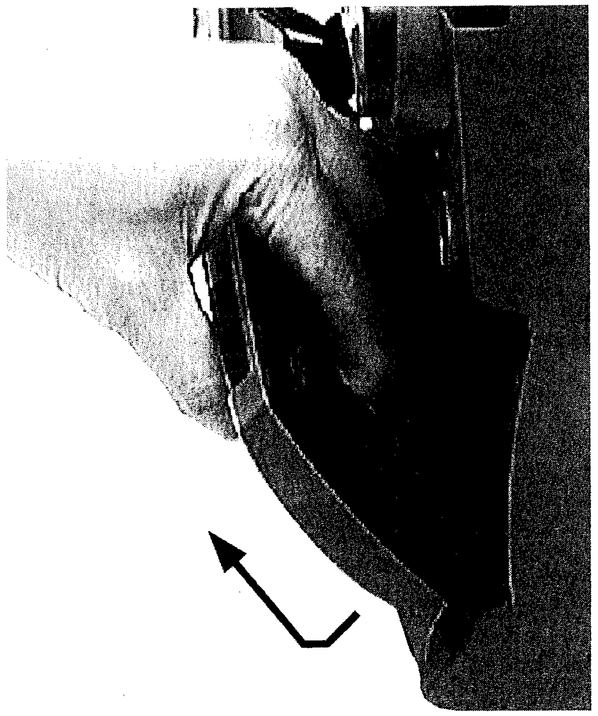
1 Press **PTY SEARCH** (Program Type) on the remote control.
  → The following program types exist and can be received by your tuner: News, Affairs, Info, Sport, Educate, Drama, Culture, Science, Varied, Pop M, Rock M, M.O.R. (middle of the road music), Light M, Classics, Other M, No type.

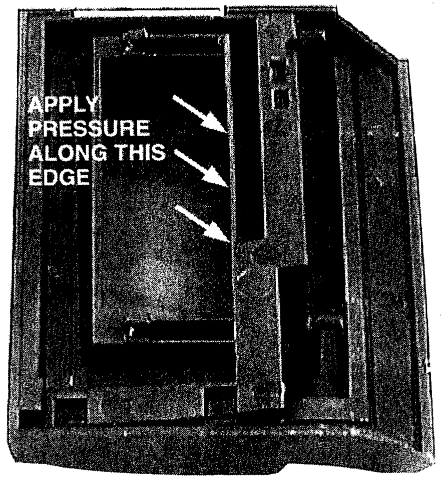


2 Press or on the system to select the desired program type.
3 Press **PTY SEARCH** on the remote control again to confirm the selection.
  → It will search for the first available RDS station with the selected program type.
  → If no RDS station is found with the selected program type, the display will show "TYPE NOT FOUND".

DISMANTLING INSTRUCTIONS

Dismantling of the Cassette Cover

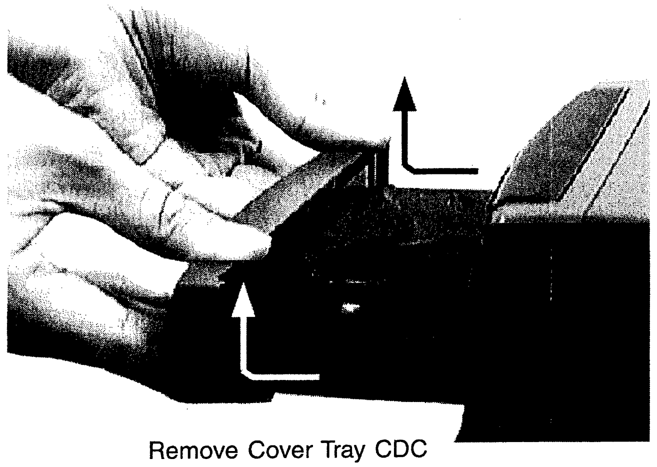




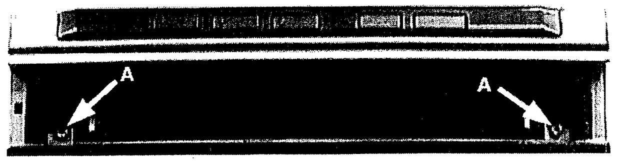
Cassette door

Dismantling of the CDC Module and Front Panel

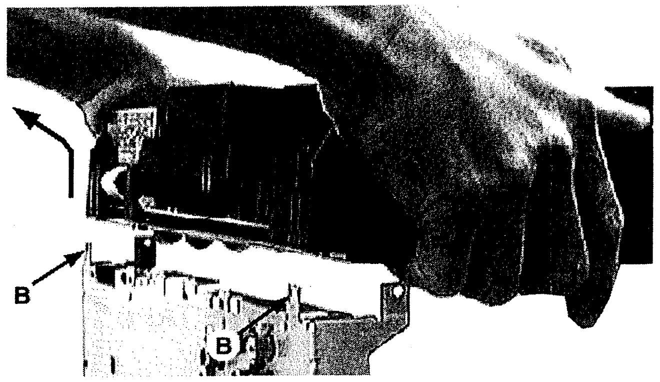
1) Loosen the 16 screws to remove the Cabinet Rear (pos 289).
   - 5 screws each on the left & right side of the Cabinet
   - 6 screws at the rear of the Cabinet
2) Remove the Plate EMC (pos. 286).
3) Slide out the tray and remove the Cover Tray CDC (pos 256) as indicated.
4) Loosen the 2 screws A and 2 screws B to remove the CDC Module (pos 1104) as indicated.
5) Place the set on its left side and remove 1 screw at the bottom of the Front Cabinet (pos 200) to separate the Front Panel assembly from the Bottom Plate (pos 291).



Remove Cover Tray CDC



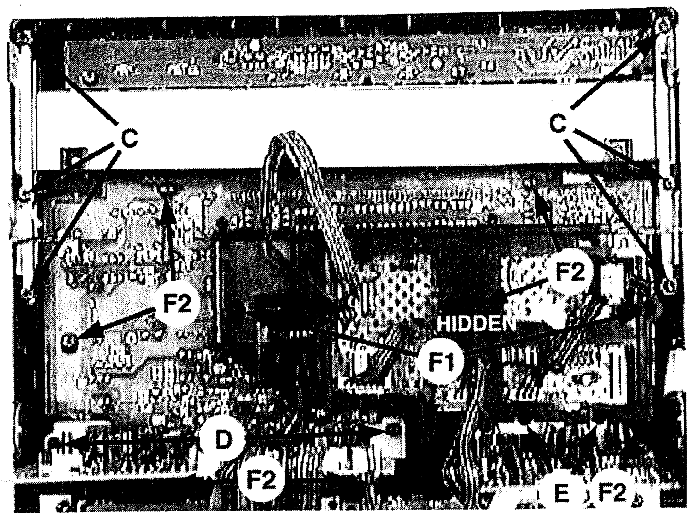
Front CDC



Remove CDC Module

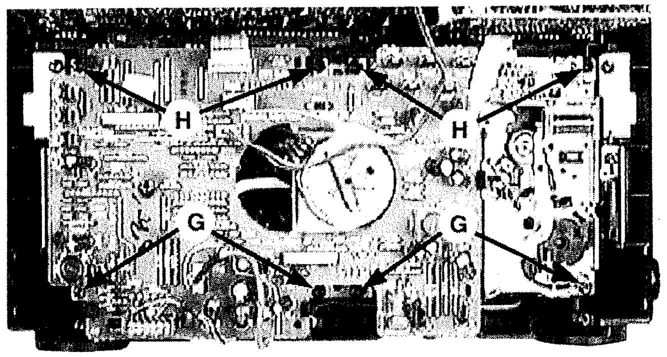
Dismantling of the Front Board

1) Remove 6 screws C as indicated to take out the CDC Left and Right Bracket (pos 272 and 273).
2) Remove 2 screws D as indicated to loosen the AF Board (pos 1101-A).
3) Remove 2 screws E as indicated to loosen the Karaoke Board (pos 1106 - only for Karaoke version).
4) Remove 3 screws F1 as indicated to loosen the Front Plate (pos 264) and Sandwich Board (pos 1102-B).
5) Remove 7 screws F2 (1 hidden screw) as indicated to loosen the Front Board (pos 1102-A).



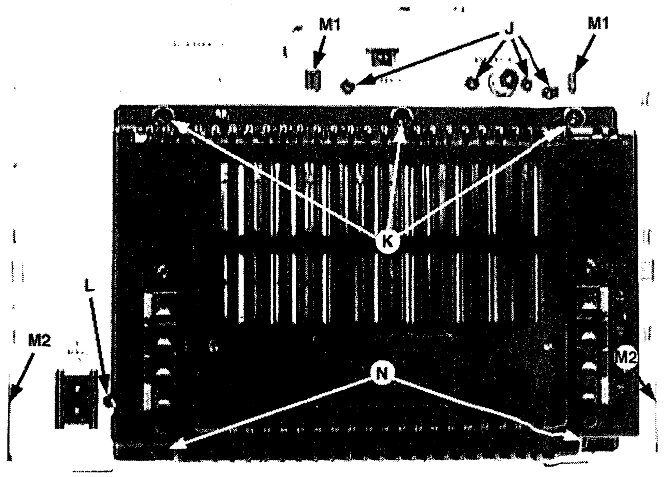
Dismantling of the ETF Module

1) Remove 8 screws (4 screws G and 4 screws H) as indicated to loosen the ETF5 Module (pos 1105).



Dismantling of Rear Plate and Power Module

1) Remove 4 screws J and uncatch M1 to loosen the Tuner Board (pos 1100).
2) Remove 3 screws K, 1 screw L (if obstructed) and uncatch M2 to take out the Rear Plate (pos 280).
3) Remove 2 screws N to free the Power Module (pos 1103) from the Bottom Plate assembly.

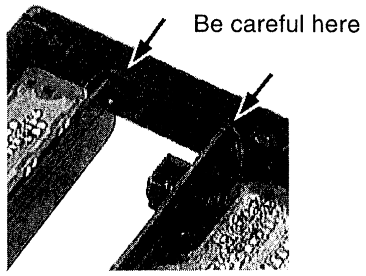


Repair Hints

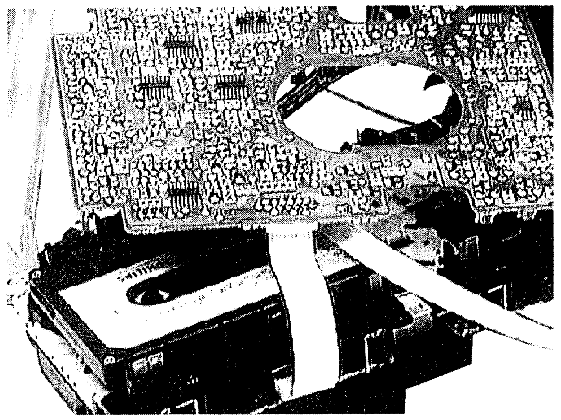
1) During re-assembly Front board, care should be taken to dress the thin bunch of wires (between Front board & CDC Key board) properly in the slots provided so that it will not be damaged by the CDC bracket (pos 272). See picture 1

2) During repair it is possible to disconnect the Tuner board and CDC Module completely unless the fault is suspected to be in that area. This will not affect the performance of the rest of the set.

3) Due to short flex cable wires in the ETF Module, the pc board should be disconnected and reconnected on the reverse side of the tape mechanism to keep it electrically connected during repair. See picture 2

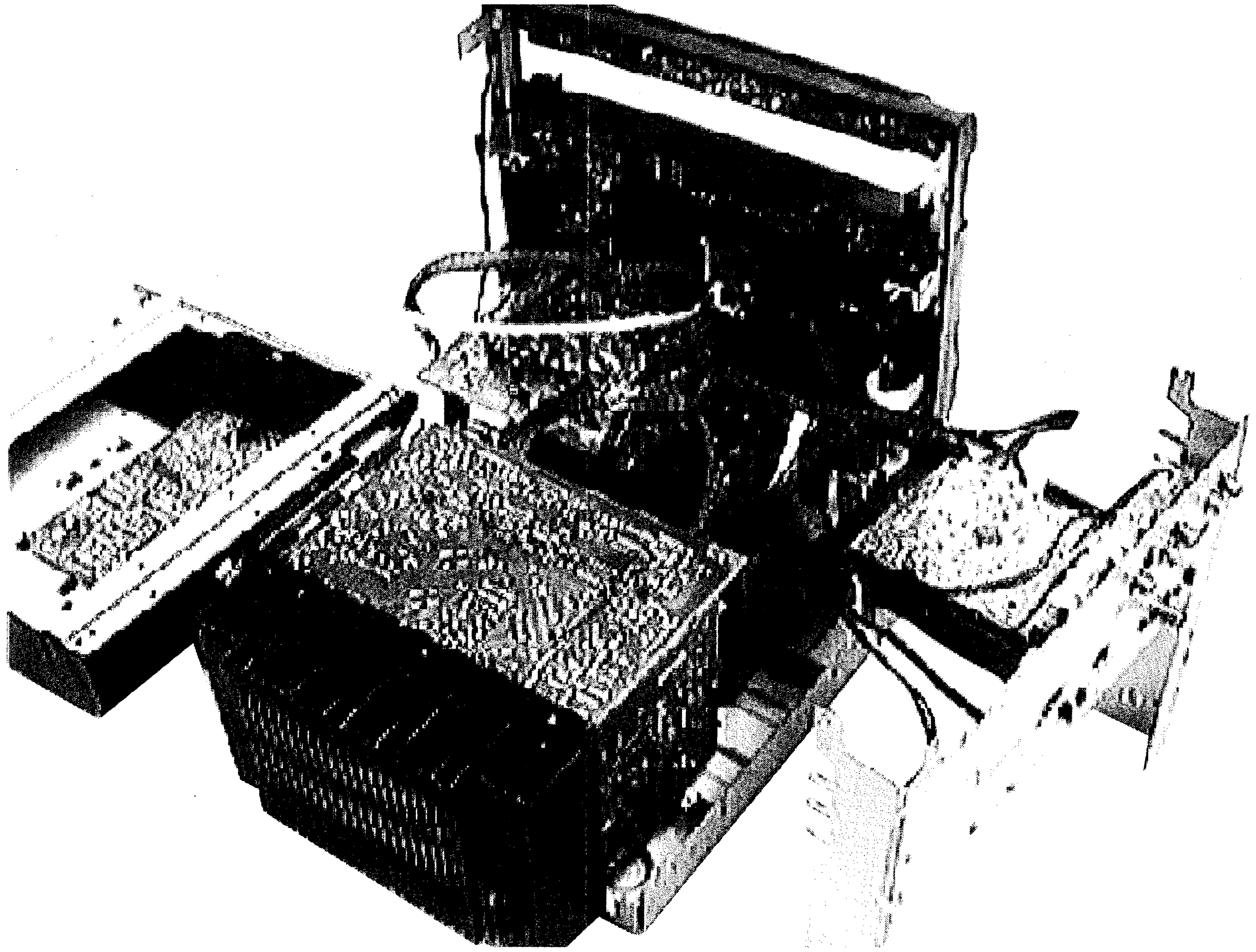


Picture 1

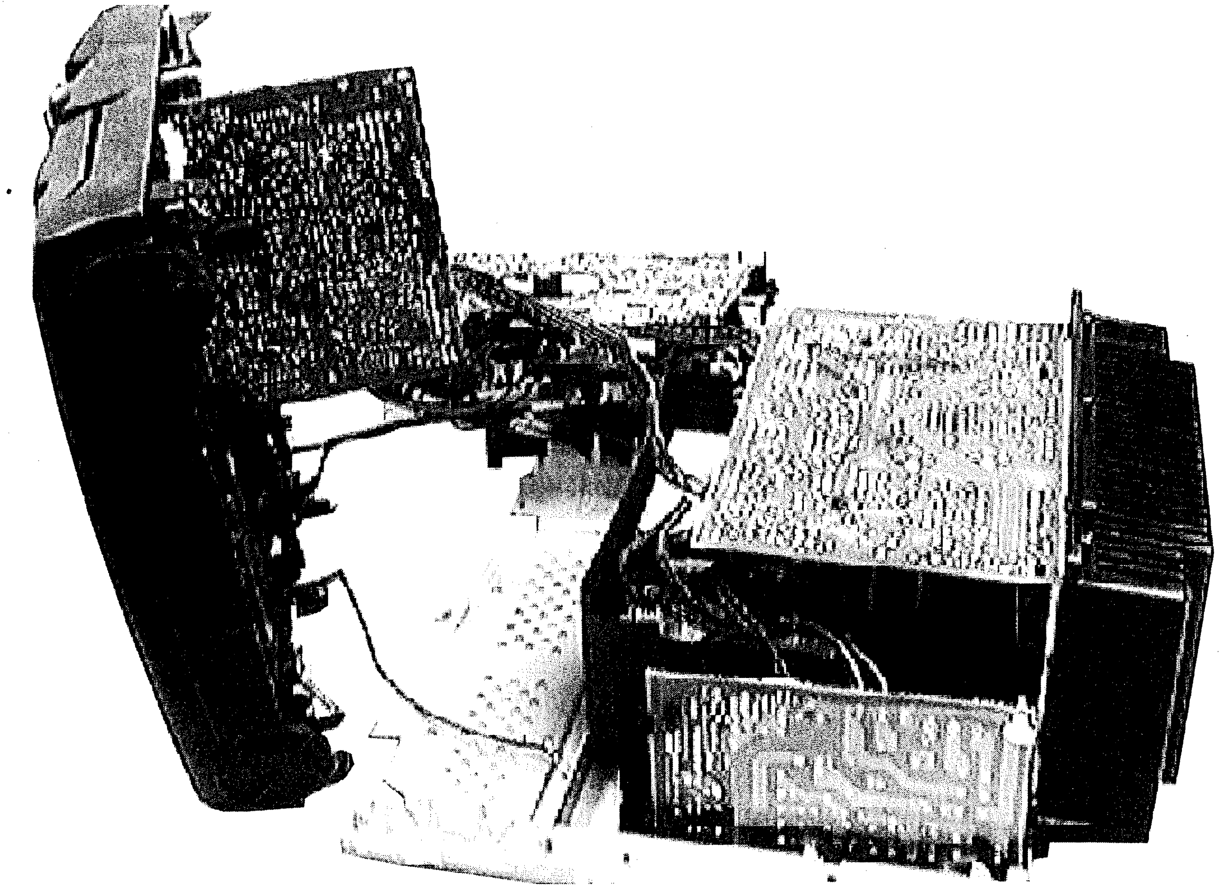


Picture 2

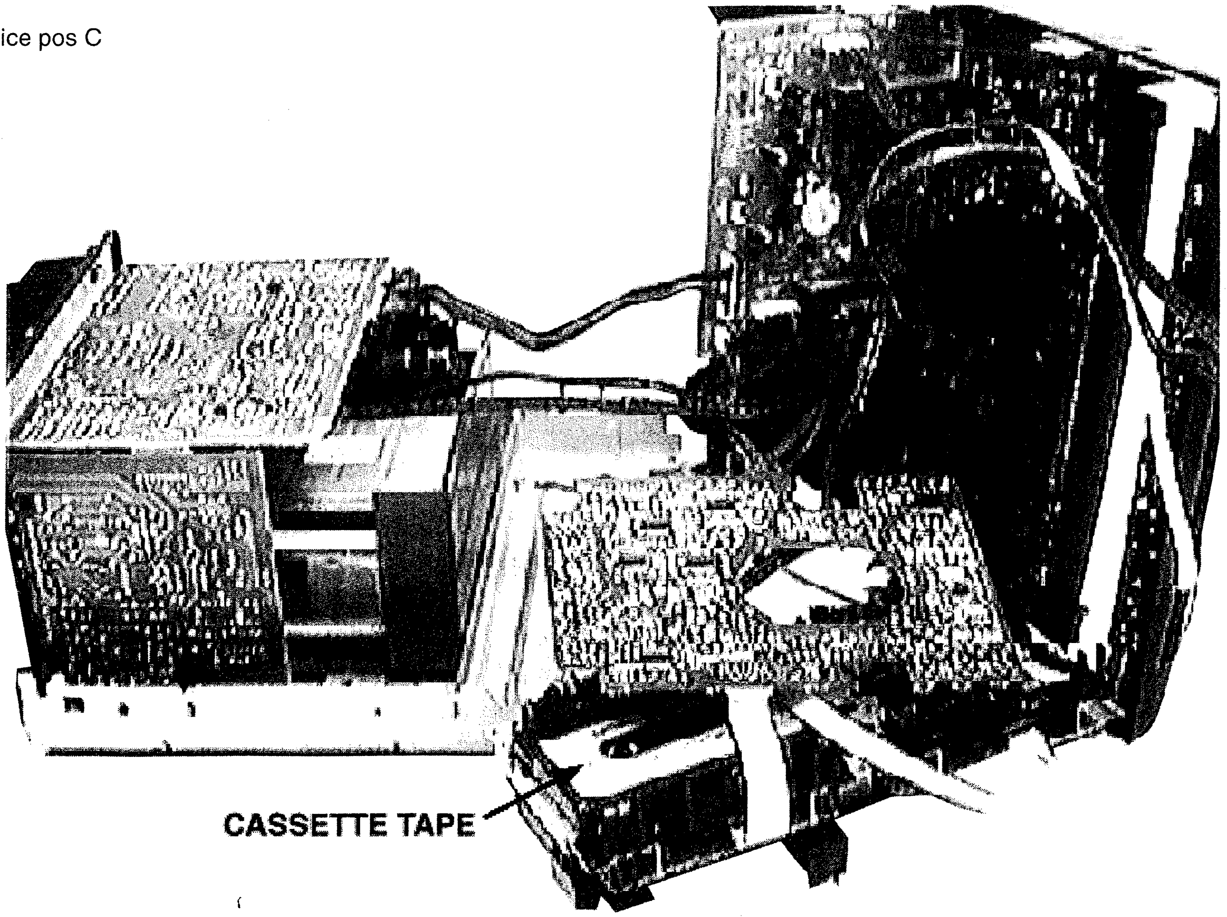
Service pos A



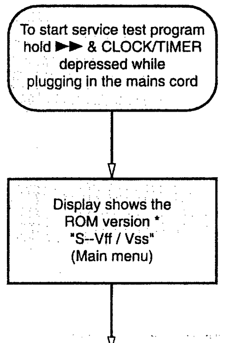
Service pos B



Service pos C



SERVICE TEST PROGRAM I


To start service test program hold ►► & CLOCK/TIMER depressed while plugging in the mains cord
Display shows the ROM version * "S--Vff / Vss" (Main menu)

S stands for Service Test program

ff stands for software version of the µProcessor on Front Display Board (counted from 01 upwards)

ss stands for software version of the µProcessor on Front Sandwich Board (counted from 01 upwards)

* When a mismatch between the 2 µProcessors happen, it will scroll "UNMATCHED FRONT" or "UNMATCHED SANDWICH"

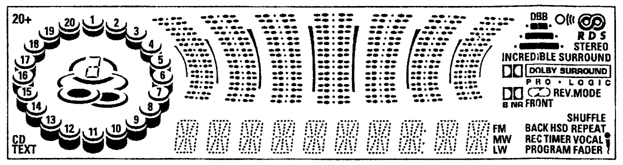

20+
DBB
RDS
STEREO
INCREDIBLE SURROUND
DOLBY SURROUND
PRO · LOGIC
REV.MODE
FRONT
SHUFFLE
BACK HSD REPEAT
REC TIMER VOCAL
PROGRAM FADER
FM
MW
LW
CD TEXT

Figure 1

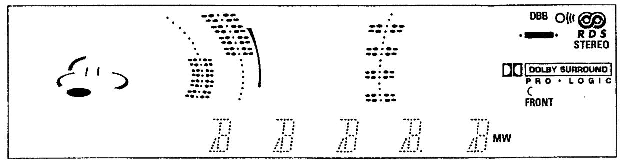
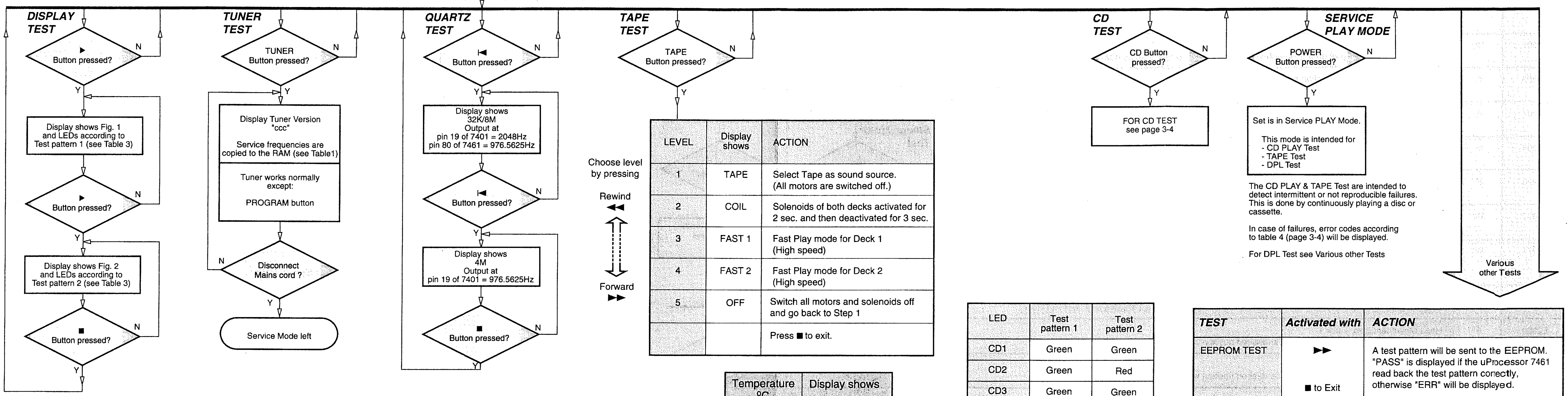

DBB
RDS
STEREO
DOLBY SURROUND
PRO · LOGIC
FRONT
MW

Figure 2


DISPLAY TEST
► Button pressed?
N
Y
Display shows Fig. 1 and LEDs according to Test pattern 1 (see Table 3)
► Button pressed?
N
Y
Display shows Fig. 2 and LEDs according to Test pattern 2 (see Table 3)
■ Button pressed?
N
Y
TUNER TEST
TUNER Button pressed?
N
Y
Display Tuner Version "ccc"
Service frequencies are copied to the RAM (see Table1)
Tuner works normally except:
PROGRAM button
Disconnect Mains cord ?
N
Y
Service Mode left
QUARTZ TEST
I◄ Button pressed?
N
Y
Display shows 32K/8M Output at pin 19 of 7401 = 2048Hz pin 80 of 7461 = 976.5625Hz
I◄ Button pressed?
N
Y
Display shows 4M Output at pin 19 of 7401 = 976.5625Hz
■ Button pressed?
N
Y
TAPE TEST
TAPE Button pressed?
N
Y
Choose level by pressing
Rewind ◄◄
Forward ►►
CD TEST
CD Button pressed?
N
Y
FOR CD TEST see page 3-4
SERVICE PLAY MODE
POWER Button pressed?
N
Y
Set is in Service PLAY Mode.
This mode is intended for
- CD PLAY Test
- TAPE Test
- DPL Test
Various other Tests

LEVEL	Display shows	ACTION
1	TAPE	Select Tape as sound source. (All motors are switched off.)
2	COIL	Solenoids of both decks activated for 2 sec. and then deactivated for 3 sec.
3	FAST 1	Fast Play mode for Deck 1 (High speed)
4	FAST 2	Fast Play mode for Deck 2 (High speed)
5	OFF	Switch all motors and solenoids off and go back to Step 1
		Press ■ to exit.

The CD PLAY & TAPE Test are intended to detect intermittent or not reproducible failures. This is done by continuously playing a disc or cassette.

In case of failures, error codes according to table 4 (page 3-4) will be displayed.

For DPL Test see Various other Tests

PRESET	Europe "EUR"	East Eur. 3-band "EAS"	East Eur. 2-band "EAS"	USA "USA"	Oversea "OSE"	Korea "KOR"	Japan "JAP"
1	87.5MHz	65.81MHz	65.81MHz	87.5MHz	87.5MHz	87.5MHz	76MHz
2	108MHz	108MHz	108MHz	108MHz	108MHz	108MHz	CH3 107.75MHz
3	531kHz	74MHz	74MHz	530kHz	531/530kHz	531kHz	90MHz
4	1602kHz	87.5MHz	87.5MHz	1700kHz	1602/1700kHz	1602kHz	CH1 95.75MHz
5	558kHz	531kHz	531kHz	560kHz	558/560kHz	558kHz	CH2 101.75MHz
6	1494kHz	1602kHz	1602kHz	1500kHz	1494/1500kHz	1494kHz	531kHz
7	153kHz	558kHz	558kHz	98MHz	87.5MHz	87.5MHz	1602kHz
8	279kHz	1494kHz	1494kHz	87.5MHz	87.5MHz	87.5MHz	558kHz
9	198kHz	153kHz	98MHz	87.5MHz	87.5MHz	87.5MHz	1494kHz
10	98MHz	279kHz	70.01MHz	87.5MHz	87.5MHz	87.5MHz	80MHz
11	87.5MHz	198kHz	65.81MHz	87.5MHz	98MHz	98MHz	76MHz

Table 1

East Europe TUNER IF offset correction

1) Input a reference frequency 87.5MHz from the generator.

2) Proceed to the Tuner Test Mode

3) Hold TUNER button down for > 3 seconds

4) The set will self-calibrate automatically and display "OFS-xx" when calibration is successful, otherwise it will display "00E".

xx : offset value between -3 to +3

Note: This has to be done whenever the Eeprom, Microprocessor or the components in the oscillator circuitry are replaced.

Temperature °C	Display shows
30	245
35	241
40	236
45	230
50	224
55	217
60	209
65	201
70	192
75	183
80	173
85	163
90	153
95	143
100	133
105	123
110	114
115	105
120	97
125	89
130	81
135	74
140	68
145	62
150	57

Table 2

LED	Test pattern 1	Test pattern 2
CD1	Green	Green
CD2	Green	Red
CD3	Green	Green
Surr. Left	On	On
Left	On	Off
Center	On	On
Right	On	Off
Surr. Right	On	On
Rock	On	Off
Classic	On	On
Techno	On	Off
Personnal	On	Off
CD	Green	Green
Tuner	Green	Red
Tape	Green	Green
Aux	Green	Red
Rewind	On	On
F. Forward	On	Off
Stop	On	Off
Play	On	On
Pause	On	On
Prev	On	Off
Next	On	Off
DBB	Off	On
IS	On	On

Table 3

TEST	*Activated with*	*ACTION*
EEPROM TEST	►► ■ to Exit	A test pattern will be sent to the EEPROM. "PASS" is displayed if the uProcessor 7461 read back the test pattern correctly, otherwise "ERR" will be displayed.
EEPROM FORMAT	◄◄	Load default data. Display shows "NEW" for 1 second. ***Caution!*** ***All presets from the customer will be lost!!***
KEY TEST	►I ■ to Exit	Key numbers according table 5 are shown on the display. (see page 3-4)
FAST CLOCK TEST	CLOCK/TIMER	The clock is switched to fast mode. "FAST" is displayed for 1 sec. Press CLOCK/TIMER again to reset the clock to normal. "NORMAL" displayed for 1 sec.
TEMPERATURE TEST	AUX ■ to Exit	Temperature of the mains transformer as monitored by the NTC resistoris displayed. Refer to Table 2 for conversion of displayed numeric into °C.
SPECTRUM ANALYSER TEST	PROGRAM ■ to Exit	Inject a Signal into the AUX input. The display shows "SA xxx/yyy" where "xxx" and "yyy" is between 0 - 255 representing channel 1 and 2respectively
VOLUME TEST	Volume Knob or Volume Up/Down	Display shows volume value for 2 seconds. Volume increases or decreases in steps of 1 until 0 (Min.) or 40 (Max.) is reached.
DPL TEST (only possible in Service Play mode)	PRO-LOGIC	The set enters into Pro-logic install mode. The noise-source switches between Left, Center, Right and Rear speakers. Pro-logic settings cannot be insall in this test.
LEAVE SERVICE TESTPROGRAM	Disconnect mains cord	

Error code	Type	Error Description
E1000	W	Focus Error Triggered when the focus could not be found within a certain time when starting up the CD or when the focus is lost for a certain time during play.
E1001	W	Radial Error Triggered when the radial servo is off-track for a certain time during play.
E1002	W	Sledge In Error The sledge did not reach its inner position (inner-switch is still close) before approximately 6 Sec. have passed. Inner-switch or sledge motor problem.
E1003	W	Sledge Out Error The sledge did not come out of its inner position (inner-switch is still open) before approximately 250 mSec. have passed by. Inner-switch or sledge motor problem.
E1005	W	Jump-offtrack error Triggered in normal play when the jump destination could not be found within a certain time.
E1006	W	Subcode Error (no subcode within time) Triggered when a new subcode was missing for a certain time during play.
E1007	W	PLL Error The Phase Lock Loop could not lock within a certain time.
E1008	W	Turntable Motor Error Generated when the CD could not reached 75% of speed during startup within a certain time. Discmotor problem.
E1020	F	Focus Search Error The focus point has not been found within a certain time.
E1070	W	The carousel switch is not open within a certain time. This can happen when either the switch is defective and closed all the time, or when the carousel is blocked when located exactly at a disc position.
E1071	W	The carousel position switch did not close within a certain time. This can happen when the switch is defective and never closes electrically, or when the carousel is blocked in between two disc positions. The time-out is approximately 5 Sec.
E1079	W	The drawer could not enter the inside position is opening again. This can be caused because the drawer is blocked by something and cannot go fully inside, or the drawer switch is defective and does not close.
E2020	F	Head Movement Error Deck 1 Generated if the head does not reach the desired position within a certain time.
E2021	F	Head Movement Error Deck 2 Generated if the head does not reach the desired position within a certain time.

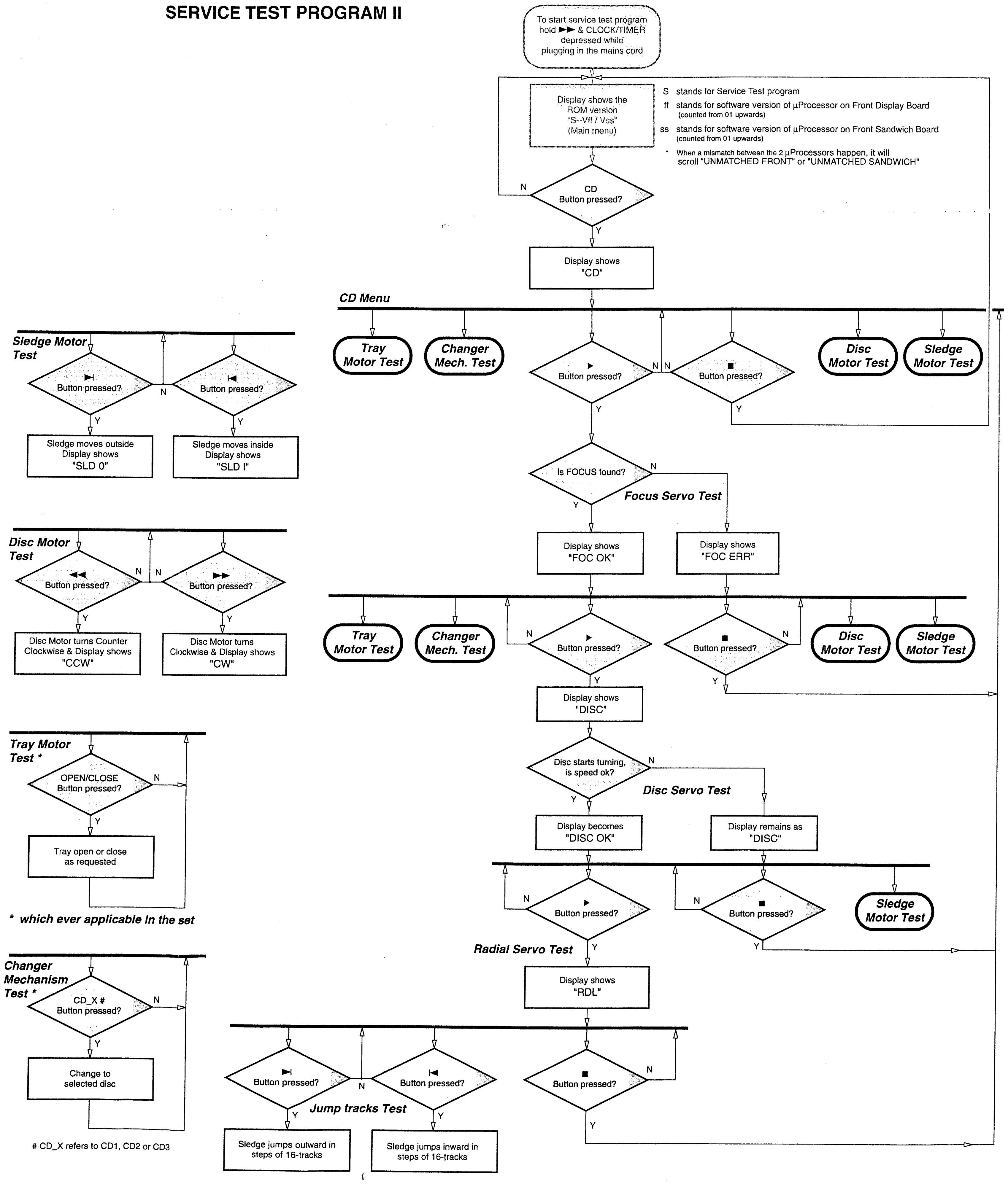
F = Fatal error & the set stop play function   W = Warning

Table 4

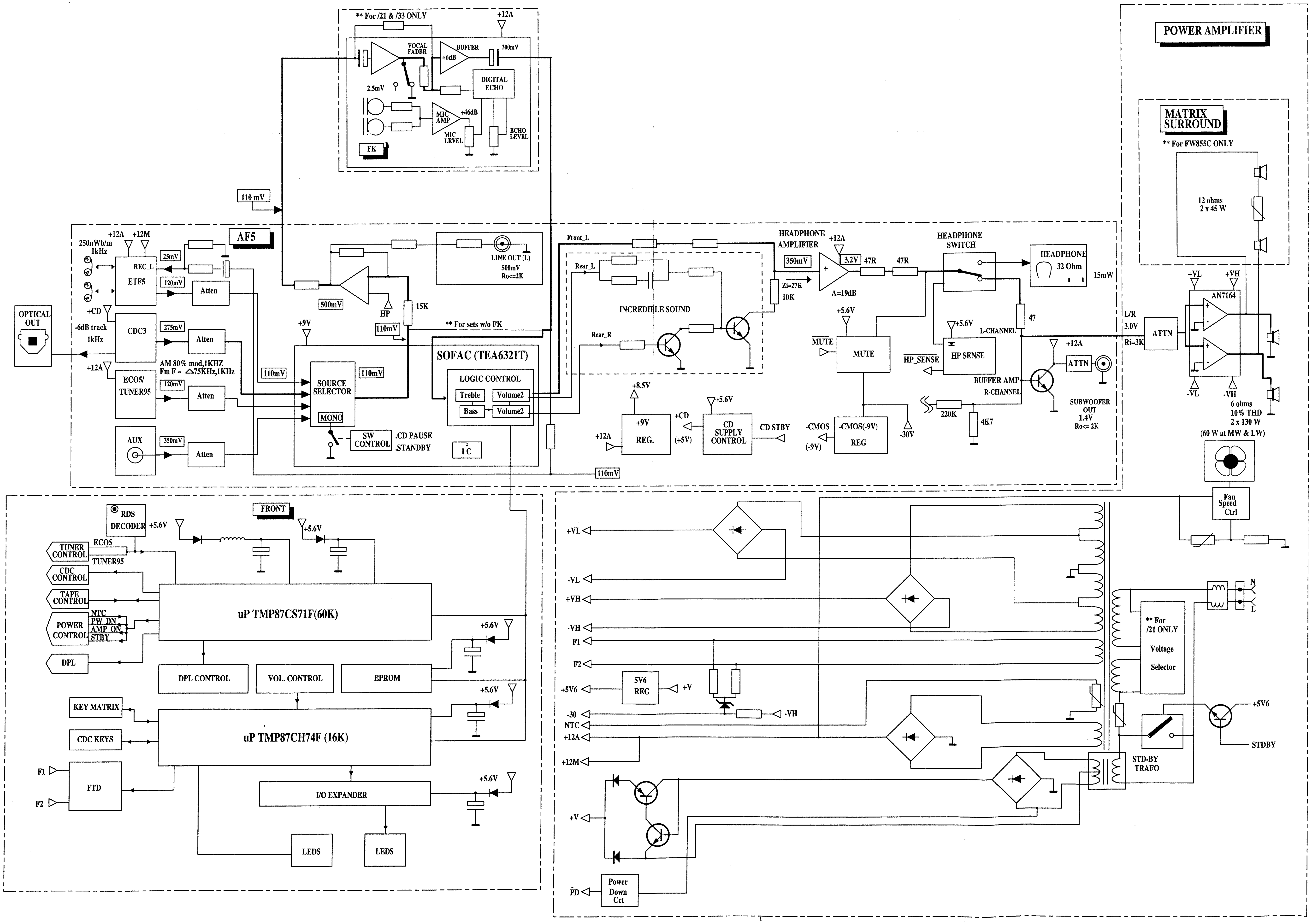
Keys activated	Display shows	Keys activated	Display shows	Keys activated	Display shows
No Key pressed	--	DBB	9	◄◄	19
Any Remote control key	RC	INCREDIBLE SURROUND	10	►►	20
CD TEXT	1	CLOCK / TIMER	11	■ (Exit Test)	
CD1	2	CD	12	►II	22
CD2	3	TUNER	13	I◄	23
CD3	4	TAPE	14	►I	24
DISC CHANGE	5	AUX	15	TAPE DUBBING	25
OPEN / CLOSE	6	PROGRAM	16	CD SYNC	26
STANDBY • ON	7	DSC	17	TAPE DOLBY	27
DPL	8	RECORD	18	TAPE MODE	28

Table 5

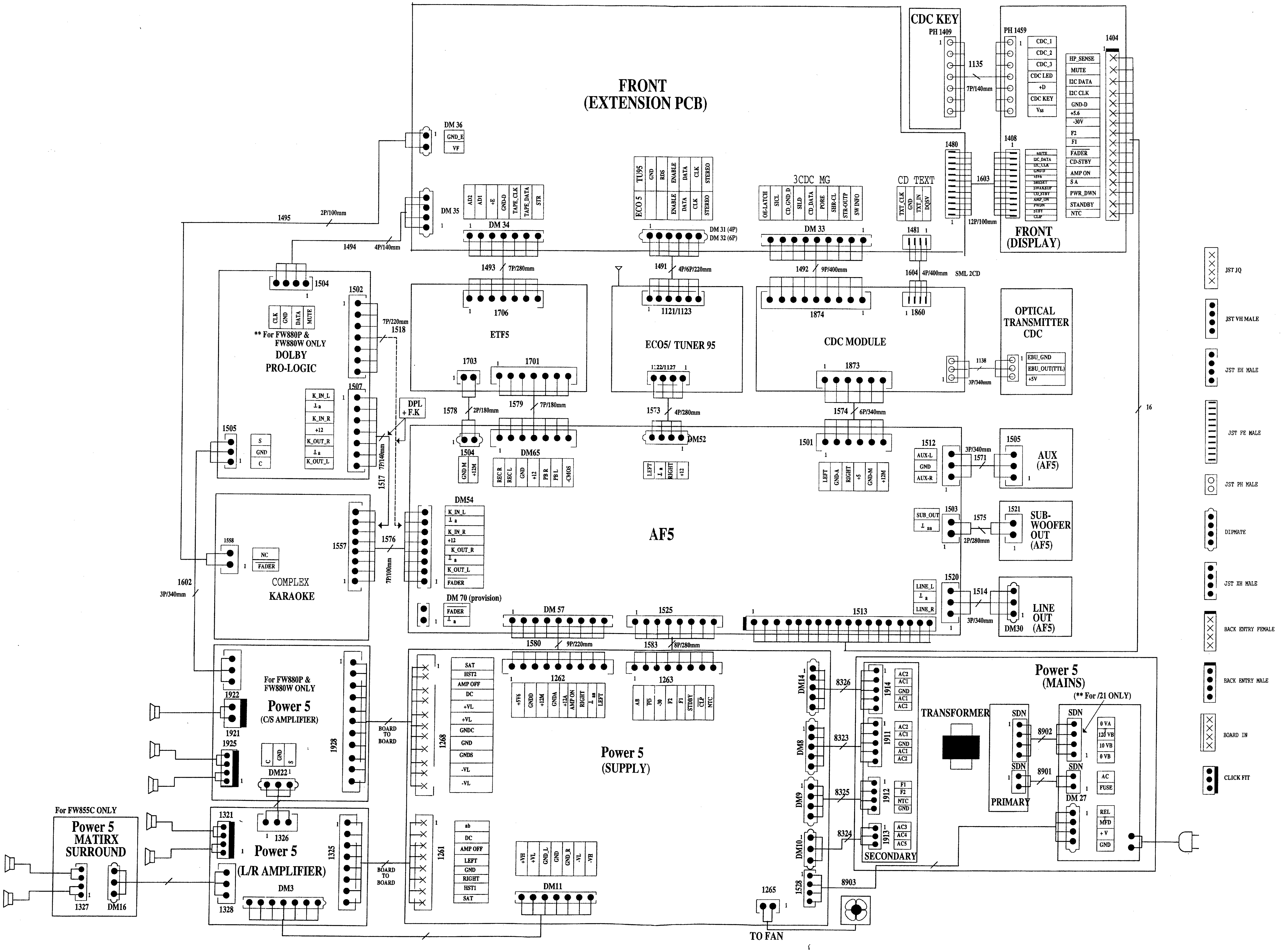
SERVICE TEST PROGRAM II


To start service test program hold ►► & CLOCK/TIMER depressed while plugging in the mains cord
Display shows the ROM version "S--Vff / Vss" (Main menu)
S stands for Service Test program
ff stands for software version of µProcessor on Front Display Board (counted from 01 upwards)
ss stands for software version of µProcessor on Front Sandwich Board (counted from 01 upwards)
* When a mismatch between the 2 µProcessors happen, it will scroll "UNMATCHED FRONT" or "UNMATCHED SANDWICH"
CD Button pressed?
N
Y
Display shows "CD"
CD Menu
Tray Motor Test
Changer Mech. Test
► Button pressed?
N
N
■ Button pressed?
Y
Y
Disc Motor Test
Sledge Motor Test
Is FOCUS found?
N
Y
Focus Servo Test
Display shows "FOC OK"
Display shows "FOC ERR"
Tray Motor Test
Changer Mech. Test
N
► Button pressed?
■ Button pressed?
N
Y
Y
Disc Motor Test
Sledge Motor Test
Display shows "DISC"
Disc starts turning, is speed ok?
N
Y
Disc Servo Test
Display becomes "DISC OK"
Display remains as "DISC"
N
► Button pressed?
N
■ Button pressed?
Y
Y
Sledge Motor Test
Radial Servo Test
Display shows "RDL"
►I Button pressed?
N
I◄ Button pressed?
Y
Y
Jump tracks Test
Sledge jumps outward in steps of 16-tracks
Sledge jumps inward in steps of 16-tracks
■ Button pressed?
N
Y
Sledge Motor Test
►I Button pressed?
N
I◄ Button pressed?
Y
Y
Sledge moves outside Display shows "SLD 0"
Sledge moves inside Display shows "SLD I"
Disc Motor Test
◄◄ Button pressed?
N
N
►► Button pressed?
Y
Y
Disc Motor turns Counter Clockwise & Display shows "CCW"
Disc Motor turns Clockwise & Display shows "CW"
Tray Motor Test *
OPEN/CLOSE Button pressed?
N
Y
Tray open or close as requested
* which ever applicable in the set
Changer Mechanism Test *
CD_X # Button pressed?
N
Y
Change to selected disc
# CD_X refers to CD1, CD2 or CD3

SET BLOCK DIAGRAM


** For /21 & /33 ONLY
+12A
VOCAL FADER
BUFFER
+6dB
300mV
2.5mV
DIGITAL ECHO
MIC AMP
+46dB
MIC LEVEL
ECHO LEVEL
FK
110 mV
AF5
+12A
+12M
250nWb/m
1kHz
25mV
REC_L
ETF5
120mV
Atten
LINE OUT (L)
500mV
Ro<=2K
500mV
HP
15K
+CD
CDC3
-6dB track
1kHz
275mV
Atten
OPTICAL OUT
+9V
110mV
** For sets w/o FK
+12A
ECO5/ TUNER95
AM 80% mod,1KHZ
Fm F = △75KHz,1KHz
120mV
Atten
110mV
SOURCE SELECTOR
110mV
MONO
SW CONTROL
.CD PAUSE
.STANDBY
AUX
350mV
Atten
SOFAC (TEA6321T)
LOGIC CONTROL
Treble
Volume2
Bass
Volume2
I²C
Front_L
Rear_L
INCREDIBLE SOUND
Rear_R
110mV
HEADPHONE AMPLIFIER
+12A
350mV
3.2V
47R
47R
Zi=27K
10K
A=19dB
HEADPHONE SWITCH
HEADPHONE
32 Ohm
15mW
+5.6V
MUTE
MUTE
+5.6V
HP_SENSE
HP SENSE
L-CHANNEL
47
+12A
ATTN
BUFFER AMP
R-CHANNEL
SUBWOOFER OUT
1.4V
Ro<= 2K
220K
4K7
+8.5V
+9V REG.
+CD
(+5V)
+12A
+5.6V
CD SUPPLY CONTROL
CD STBY
-CMOS
(-9V)
-CMOS(-9V) REG
-30V
POWER AMPLIFIER
MATRIX SURROUND
** For FW855C ONLY
12 ohms
2 x 45 W
+VL
+VH
AN7164
L/R
3.0V
Ri=3K
ATTN
-VL
-VH
6 ohms
10% THD
2 x 130 W
(60 W at MW & LW)
Fan Speed Ctrl
RDS DECODER
+5.6V
FRONT
+5.6V
TUNER CONTROL
ECO5
TUNER95
CDC CONTROL
TAPE CONTROL
POWER CONTROL
NTC
PW_DN
AMP_ON
STBY
uP TMP87CS71F(60K)
+5.6V
DPL
DPL CONTROL
VOL. CONTROL
EPROM
+5.6V
KEY MATRIX
CDC KEYS
uP TMP87CH74F (16K)
F1
F2
FTD
+5.6V
I/O EXPANDER
LEDS
LEDS
+VL
-VL
+VH
-VH
F1
F2
+5V6
5V6 REG
+V
-30
-VH
NTC
+12A
+12M
+V
PD
Power Down Cct
N
L
** For /21 ONLY
Voltage Selector
+5V6
STDBY
STD-BY TRAFO

SET WIRING DIAGRAM


FRONT
(EXTENSION PCB)
CDC KEY
PH 1409
1135
7P/140mm
PH 1459
CDC_1
CDC_2
CDC_3
CDC LED
+D
CDC KEY
Vss
1404
HP_SENSE
MUTE
I2C DATA
I2C CLK
GND-D
+5.6
-30V
F2
F1
FADER
CD-STBY
AMP ON
S A
PWR_DWN
STANDBY
NTC
1480
1408
1603
12P/100mm
FRONT
(DISPLAY)
DM 36
GND_E
VF
DM 35
1495
2P/100mm
1494
4P/140mm
AD2
AD1
+E
GND-D
TAPE_CLK
TAPE_DATA
STR
DM 34
TU95
ECO 5
GND
RDS
ENABLE
DATA
CLK
STEREO
DM 31 (4P)
DM 32 (6P)
3CDC MG
OE-LATCH
SICL
CD_GND_D
SILD
CD_DATA
PORE
SHR-CL
STR-OUTP
SW INFO
DM 33
CD TEXT
TXT_CLK
GND
TXT_IN
DQSV
1481
1493
7P/280mm
1491
4P/6P/220mm
1492
9P/400mm
1604
4P/400mm
SML 2CD
1504
1502
CLK
GND
DATA
MUTE
** For FW880P &
FW880W ONLY
DOLBY
PRO-LOGIC
7P/220mm
1518
1507
K_IN_L
K_IN_R
+12
K_OUT_R
K_OUT_L
1505
S
GND
C
DPL
+F.K
1706
ETF5
1703
1701
1121/1123
ECO5/ TUNER 95
1122/1127
1874
1860
CDC MODULE
1873
OPTICAL
TRANSMITTER
CDC
1138
3P/340mm
EBU_GND
EBU_OUT(TTL)
+5V
1578
2P/180mm
1579
7P/180mm
1573
4P/280mm
1574
6P/340mm
16
1504
GND M
+12M
DM65
REC R
REC L
GND
+12
PB R
PB L
-CMOS
DM52
LEFT
RIGHT
+12
1501
LEFT
GND-A
RIGHT
+5
GND-M
+12M
1512
AUX-L
GND
AUX-R
3P/340mm
1571
1505
AUX
(AF5)
1517
7P/140mm
1557
1576
7P/100mm
1558
NC
FADER
COMPLEX
KARAOKE
DM54
K_IN_L
K_IN_R
+12
K_OUT_R
K_OUT_L
FADER
AF5
SUB_OUT
1503
1575
2P/280mm
1521
SUB-
WOOFER
OUT
(AF5)
1520
LINE_L
LINE_R
1514
3P/340mm
LINE
OUT
DM30
(AF5)
1602
3P/340mm
DM 70 (provision)
FADER
DM 57
1525
1513
1580
9P/220mm
1583
8P/280mm
1922
For FW880P &
FW880W ONLY
Power 5
(C/S AMPLIFIER)
1921
1925
DM22
C
GND
S
1928
BOARD
TO
BOARD
1268
SAT
HST2
AMP OFF
DC
+VL
+VL
GNDC
GND
GNDS
-VL
-VL
1262
+5V6
GNDD
+12M
GNDA
+12A
AMP ON
RIGHT
LEFT
1263
AB
PIS
-30
F2
F1
STDBY
CLP
NTC
Power 5
(SUPPLY)
DM14
8326
1914
AC2
AC1
GND
AC1
AC2
DM8
8323
1911
DM9
8325
1912
F1
F2
NTC
GND
DM10
8324
1913
AC3
AC4
AC5
SECONDARY
1528
8903
TRANSFORMER
SDN
8902
8901
PRIMARY
Power 5
(MAINS)
(** For /21 ONLY)
0 VA
12 VB
10 VB
0 VB
AC
FUSE
DM 27
REL
MFD
+V
GND
For FW855C ONLY
Power 5
MATIRX
SURROUND
1327
DM16
1321
1326
Power 5
(L/R AMPLIFIER)
1325
1328
DM3
BOARD
TO
BOARD
1261
ab
DC
AMP OFF
LEFT
GND
RIGHT
HST1
SAT
+VH
+VL
GND_L
GND
GND_R
-VL
-VH
DM11
1265
TO FAN
JST JQ
JST VH MALE
JST EH MALE
JST FE MALE
JST PH MALE
DIPMATE
JST XH MALE
BACK ENTRY FEMALE
BACK ENTRY MALE
BOARD IN
CLICK FIT

FRONT BOARD

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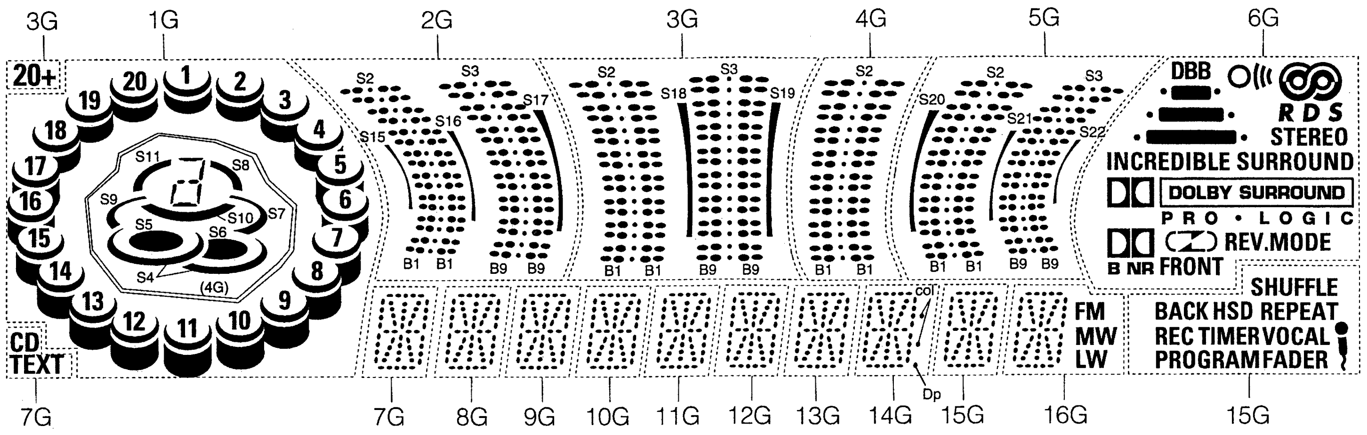
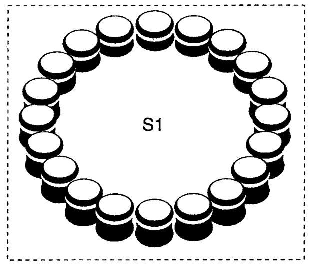
Front Display part - Circuit diagram 6-3
Sandwich part - Circuit diagram 6-4
Sandwich part - Component & Chip layout 6-5
Key-CDC part - Layouts & Circuit diagram 6-6
Electrical parts list 6-7

FTD DISPLAY PIN CONNECTIONS



3G
1G
2G
3G
4G
5G
6G
20+
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
S4 S5 S6 S7 S8 S9 S10 S11
(4G)
S2 S3 S15 S16 S17 S18 S19 S20 S21 S22
B1 B9
col
Dp
DBB
RDS
STEREO
INCREDIBLE SURROUND
DOLBY SURROUND
PRO • LOGIC
REV.MODE
B NR FRONT
SHUFFLE
BACK HSD REPEAT
REC TIMER VOCAL
PROGRAM FADER
FM
MW
LW
CD
TEXT
7G
7G 8G 9G 10G 11G 12G 13G 14G 15G 16G 15G



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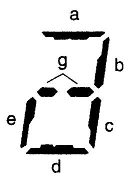

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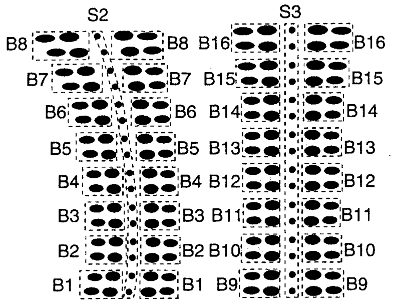
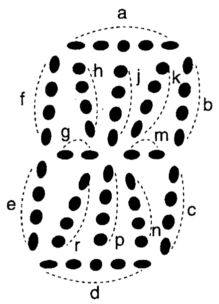


S2
S3
B8 B7 B6 B5 B4 B3 B2 B1
B16 B15 B14 B13 B12 B11 B10 B9

(2G ~ 5G)



a
h
j
k
f
b
g
m
e
c
r
p
n
d

(7G ~ 16G)

	1G	2G	3G	4G	5G	6G	7G	8G~13G	14G	15G	16G
P1	**1**	B1	B1	B1	B9	RDS	a	a	a	a	a
P2	**2**	B9	B9	B2	B1	O(((	h	h	h	h	h
P3	**3**	B2	B2	B3	B10	**DBB**	j , p	j , p	j , p	j , p	j , p
P4	**4**	B10	B10	B4	B2	•▬•	k	k	k	k	k
P5	**5**	B3	B3	B5	B11	•▬▬•	b	b	b	b	b
P6	**6**	B11	B11	B6	B3	•▬▬▬•	f	f	f	f	f
P7	**7**	B4	B4	B7	B12	**STEREO**	m	m	m	m	m
P8	**8**	B12	B12	B8	B4	**INCREDIBLE SURROUND**	g	g	g	g	g
P9	**9**	S2	S2	S2	S3	DOLBY SURROUND PRO • LOGIC	c	c	c	c	c
P10	**10**	S15	S18	S4	S20	B NR	e	e	e	e	e
P11	**11**	S3	S3	S5	S2	**FRONT**	r	r	r	r	r
P12	**12**	S16	S19	S6	S21	**REV.MODE**	n	n	n	n	n
P13	**13**	S17	**20+**	S7	S22	(	d	d	d	d	d
P14	**14**	B8	B8	B8	B16	)	**CD TEXT**	-	col	**SHUFFLE**	**FM**
P15	**15**	B16	B16	B9	B8	-	-	-	Dp	**REPEAT**	**MW**
P16	**16**	B5	B5	B10	B13	-	-	-	-	**VOCAL FADER**	**LW**
P17	**20**	B13	B13	B11	B5	-	-	-	-	**HSD**	-
P18	**17**	B7	B7	a , g , d	B15	-	-	-	-	**BACK**	-
P19	**18**	B15	B15	e	B7	-	-	-	-	**TIMER**	-
P20	**19**	B6	B6	b	B14	-	-	-	-	**REC**	-
P21	S1	B14	B14	c	B6	-	-	-	-	**PROGRAM**	-

Front

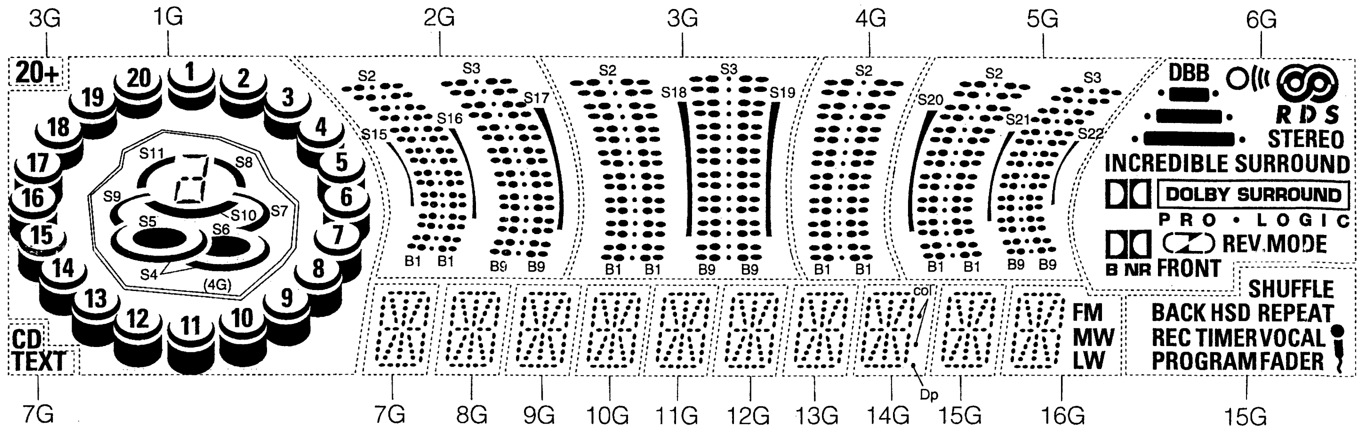
PC B
A877
A877
A878
A879
A879

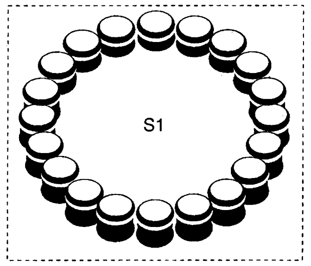
Varia

31
32
35
36
1404
1407
1445
1451
1481
1489
2418
2476
2481
2482
2484
2485
2486
2487
2489
2494
3504
3610
3631
3643
3645
3647
3651
3654
3655
3658
3659
3660
3661
3662
3663
4503
5402
5464
6426
6464
7463
9566

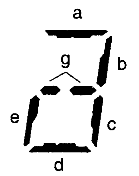
x = Iter

FTD DISPLAY PIN CONNECTIONS

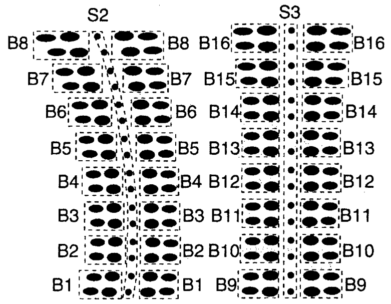

3G
1G
2G
3G
4G
5G
6G
20+
CD TEXT
S2 S3 S15 S16 S17 S18 S19 S20 S21 S22
B1 B9
DBB
RDS
STEREO
INCREDIBLE SURROUND
DOLBY SURROUND
PRO • LOGIC
REV.MODE
B NR FRONT
SHUFFLE
BACK HSD REPEAT
REC TIMER VOCAL
PROGRAM FADER
FM
MW
LW
col
Dp
7G
7G
8G
9G
10G
11G
12G
13G
14G
15G
16G
15G



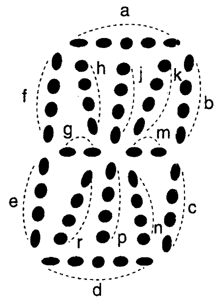
(1G)



(4G)


S2
S3
B1 B2 B3 B4 B5 B6 B7 B8
B9 B10 B11 B12 B13 B14 B15 B16

(2G ~ 5G)


a
f
h
j
k
b
g
m
e
r
p
n
c
d

(7G ~ 16G)

	1G	2G	3G	4G	5G	6G	7G	8G~13G	14G	15G	16G
P1	**1**	B1	B1	B1	B9	RDS	a	a	a	a	a
P2	**2**	B9	B9	B2	B1	O(((	h	h	h	h	h
P3	**3**	B2	B2	B3	B10	**DBB**	j , p	j , p	j , p	j , p	j , p
P4	**4**	B10	B10	B4	B2	•▬•	k	k	k	k	k
P5	**5**	B3	B3	B5	B11	•▬▬•	b	b	b	b	b
P6	**6**	B11	B11	B6	B3	•▬▬▬•	f	f	f	f	f
P7	**7**	B4	B4	B7	B12	**STEREO**	m	m	m	m	m
P8	**8**	B12	B12	B8	B4	**INCREDIBLE SURROUND**	g	g	g	g	g
P9	**9**	S2	S2	S2	S3	**DOLBY SURROUND** **PRO • LOGIC**	c	c	c	c	c
P10	**10**	S15	S18	S4	S20	**B NR**	e	e	e	e	e
P11	**11**	S3	S3	S5	S2	**FRONT**	r	r	r	r	r
P12	**12**	S16	S19	S6	S21	**REV.MODE**	n	n	n	n	n
P13	**13**	S17	**20+**	S7	S22	(	d	d	d	d	d
P14	**14**	B8	B8	B8	B16	)	**CD TEXT**	-	col	**SHUFFLE**	**FM**
P15	**15**	B16	B16	B9	B8	-	-	-	Dp	**REPEAT**	**MW**
P16	**16**	B5	B5	B10	B13	-	-	-	-	**VOCAL FADER**	**LW**
P17	**20**	B13	B13	B11	B5	-	-	-	-	**HSD**	-
P18	**17**	B7	B7	a , g , d	B15	-	-	-	-	**BACK**	-
P19	**18**	B15	B15	e	B7	-	-	-	-	**TIMER**	-
P20	**19**	B6	B6	b	B14	-	-	-	-	**REC**	-
P21	S1	B14	B14	c	B6	-	-	-	-	**PROGRAM**	-

Front Board application

PC Board	Used by:
A87770	FW850C/21/21M, FW855C/21/21M/33
A87790	FW850C/22/34, FW855C/34
A87830	FW860P/21/21M
A87900	FW880P/21/21M/33, FW880W/21/21M
A87920	FW880P/22/34, FW880W/22/34

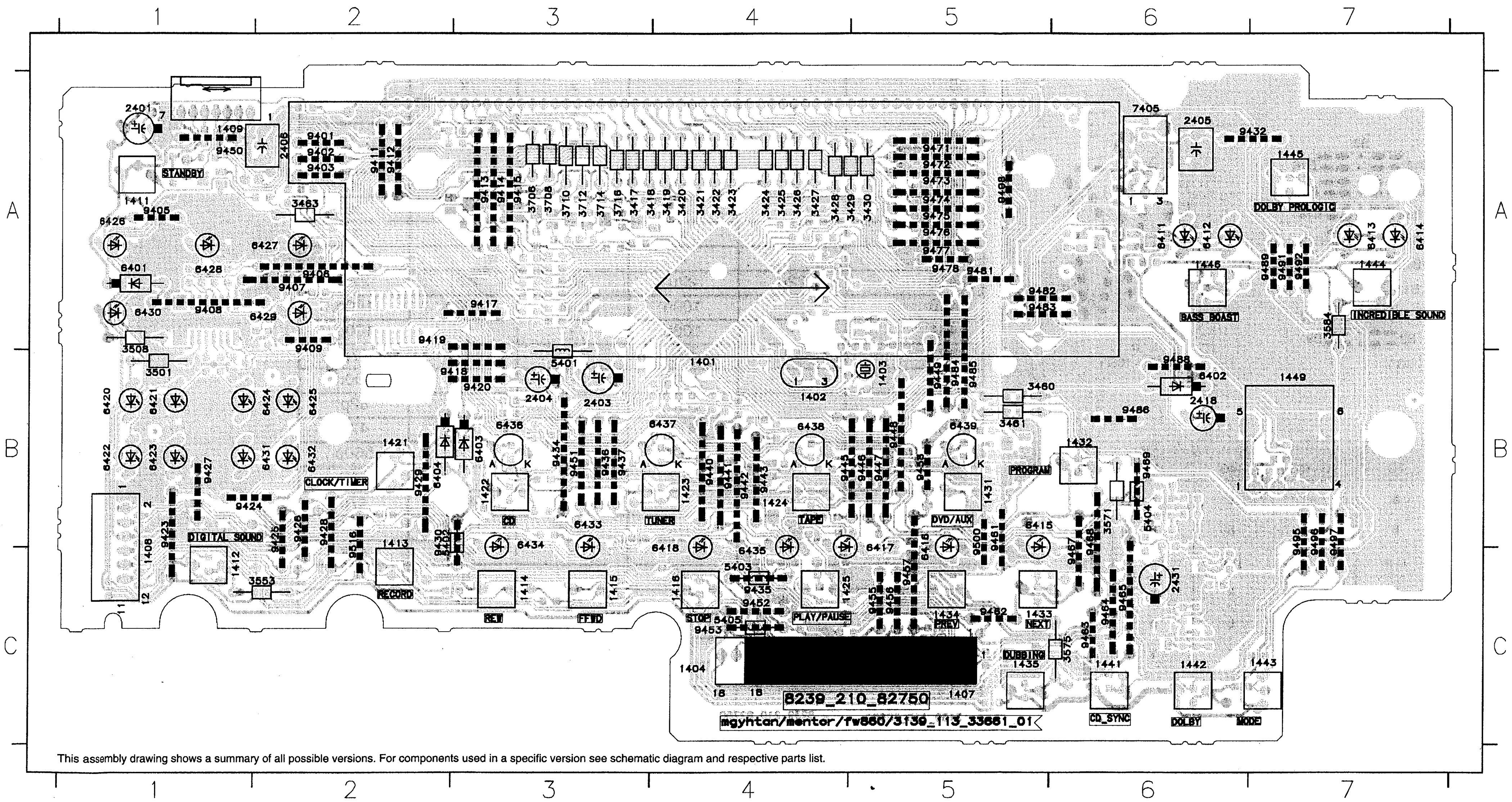
Variations table for Front boards

	A87770	A87790	A87830	A87900	A87920
31	x	-	x	x	-
32	-	x	-	-	x
35	-	-	x	x	x
36	x	-	x	x	-
1404	x	x	-	x	x
1407	-	-	x	-	-
1445	-	-	x	x	x
1451	-	x	x	x	x
1481	-	x	x	x	x
1489	-	x	-	-	x
2418	22u	22u	10u	22u	22u
2476	-	100n	100n	100n	100n
2481	-	100p	-	-	100p
2482	-	47p	-	-	47p
2484	-	100n	-	-	100n
2485	-	82p	-	-	82p
2486	-	47p	-	-	47p
2487, 2488	-	560p	-	-	560p
2489	-	2u2	-	-	2u2
2494	-	-	-	47u	47u
3504 - 3508	-	-	150R	150R	150R
3610	-	-	-	47k	47k
3631	-	1k	-	-	1k
3643, 3644	10k	-	10k	10k	-
3645, 3646	-	10k	-	-	10k
3647	-	2k2	-	-	2k2
3651	-	220k	-	-	220k
3654	-	-	3k3	3k3	3k3
3655	47k	47k	-	-	-
3658	3k3	-	3k3	3k3	-
3659	-	47k	-	-	47k
3660	-	3k3	3k3	3k3	3k3
3661	47k	-	-	-	-
3662	3k3	3k3	-	3k3	3k3
3663	-	-	47k	-	-
4503	-	x	-	-	x
5402 - 5406	2u2	2u2	-	2u2	2u2
5464	-	2u2	-	-	2u2
6426 - 6430	-	-	x	x	x
6464	-	-	-	x	x
7463	-	x	-	-	x
9566	x	x	x	-	-

x = Item in use

FRONT DISPLAY BOARD - COMPONENT VIEW

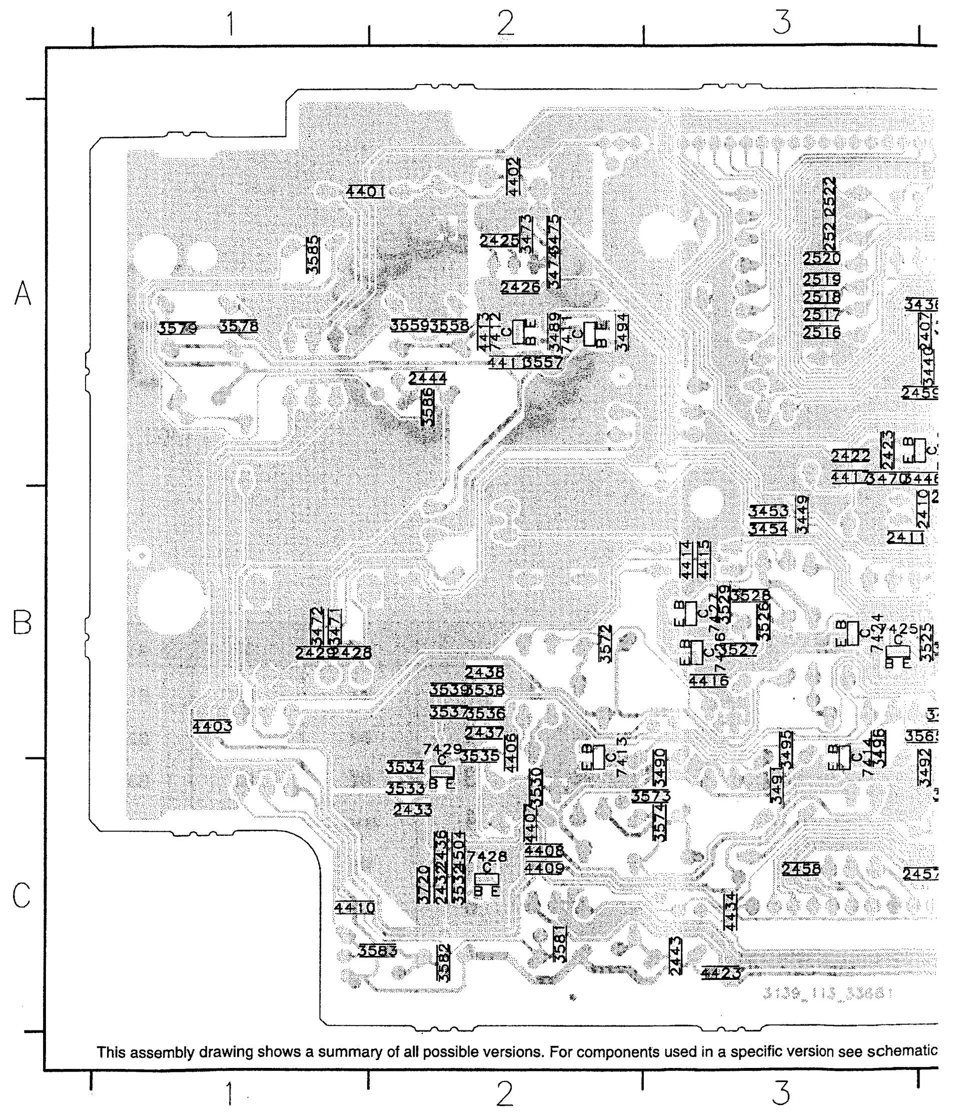
1401	B4	1414	C3	1433	C5	2401	A1	3420	A4	3430	A5	3706	A3	6404	B2	6421	B1	6431	B2	9401	A2	9413	A3	9426	B2	9440	B4	9451	C4	9464	C6	9476	A5	9489	A7
1402	B4	1415	C3	1434	C5	2403	B3	3421	A4	3460	B5	3708	A3	6411	A6	6422	B1	6432	B2	9402	A2	9414	A3	9427	B1	9441	B4	9452	C4	9465	C6	9477	A5	9491	A7
1403	B5	1416	C4	1435	C5	2404	B3	3422	A4	3461	B5	3710	A3	6412	A6	6423	B1	6433	B3	9403	A2	9415	A3	9428	B2	9442	B4	9453	C4	9467	C6	9478	A5	9492	A7
1404	C4	1421	B2	1441	C6	2405	A6	3423	A4	3463	A2	3712	A3	6413	A7	6424	B2	6434	B3	9405	A1	9417	A3	9429	B2	9443	B4	9455	C5	9468	B6	9481	A5	9495	B7
1407	C5	1422	B3	1442	C6	2406	A2	3424	A4	3501	B1	3714	A3	6414	A7	6425	B2	6435	C4	9406	A1	9418	B2	9430	B2	9445	B4	9456	C5	9469	B6	9482	A5	9496	B7
1408	C1	1423	B3	1443	C7	2418	B6	3425	A4	3508	A1	3716	A3	6415	B5	6426	A1	6436	B3	9407	A1	9419	A2	9432	A7	9446	B5	9457	C5	9471	A5	9483	A5	9497	B7
1409	A1	1424	B4	1444	A7	2431	C6	3426	A4	3553	C2	5401	A3	6416	B5	6427	A2	6437	B4	9408	A1	9420	B2	9434	B3	9447	B5	9458	B5	9472	A5	9484	B5	9498	A5
1411	A1	1425	C5	1445	A7	3417	A3	3427	A4	3571	B6	6401	A1	6417	C5	6428	A1	6438	B4	9409	A2	9423	B1	9435	B3	9448	B5	9461	B5	9473	A5	9485	B5	9500	B5
1412	C1	1431	B5	1446	A6	3418	A3	3428	A4	3575	C6	6402	B6	6418	C4	6429	A2	6439	B5	9411	A2	9424	B1	9436	B3	9449	B5	9462	C5	9474	A5	9486	B6	9516	B2
1413	B2	1432	B6	1449	B7	3419	A4	3429	A4	3584	A7	6403	B3	6420	B1	6430	A1	7405	A6	9412	A2	9425	B2	9437	B3	9450	A1	9463	C6	9475	A5	9488	B6		



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

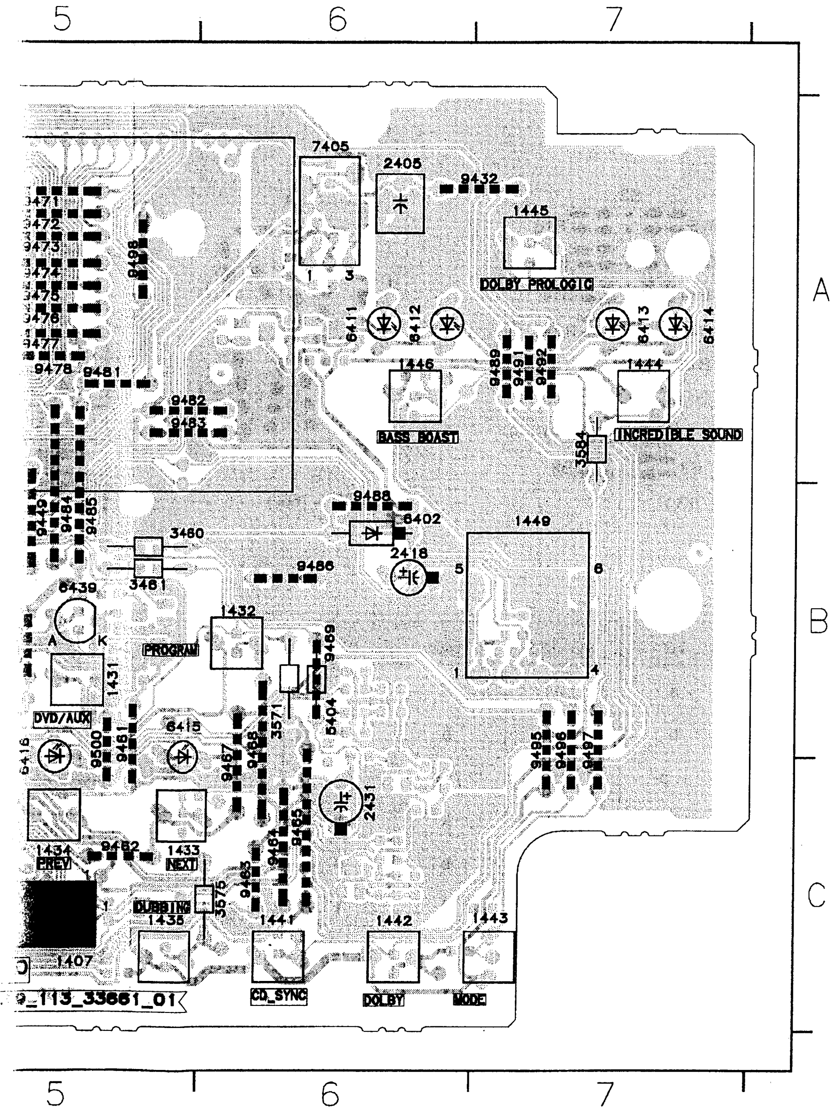
FRONT DISPLAY BOARD - COPPER SIDE VIEW

2407	A4	2426	A2	2447	B7	2513	A5	3405	A5	3433	A4	3454	B3	3476	C4	35
2408	B4	2428	B1	2448	A6	2514	A5	3406	A5	3434	A4	3455	B4	3477	A4	35
2409	B4	2429	B1	2449	A6	2515	A6	3407	A5	3435	A4	3456	B4	3478	A4	35
2410	B4	2432	C2	2451	A5	2516	A3	3408	A5	3436	A4	3457	B4	3479	A4	35
2411	B3	2433	C2	2452	A5	2517	A3	3409	A5	3437	A4	3458	B4	3489	A2	35
2413	B4	2436	C2	2453	A5	2518	A3	3410	A5	3439	A4	3462	B5	3490	C3	35
2414	B4	2437	B2	2454	A5	2519	A3	3411	A5	3440	A4	3466	B5	3491	C3	35
2415	B4	2438	B2	2455	A5	2520	A3	3412	A5	3441	A6	3468	B5	3492	C4	35
2416	B4	2441	C4	2456	A5	2521	A3	3413	A5	3442	A6	3470	A3	3493	C4	35
2417	B4	2442	C4	2457	C4	2522	A3	3414	A5	3443	A6	3471	B1	3494	A2	35
2421	B4	2443	C3	2458	C3	3401	A5	3415	A5	3445	A4	3472	B1	3495	B3	35
2422	A3	2444	A2	2459	A4	3402	A5	3416	A4	3446	A4	3473	A2	3496	B3	35
2423	A3	2445	A6	2460	A5	3403	A5	3431	A4	3449	B3	3474	A2	3497	B4	35
2425	A2	2446	B7	2464	C4	3404	A5	3432	A4	3453	B3	3475	A2	3502	B7	35



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic

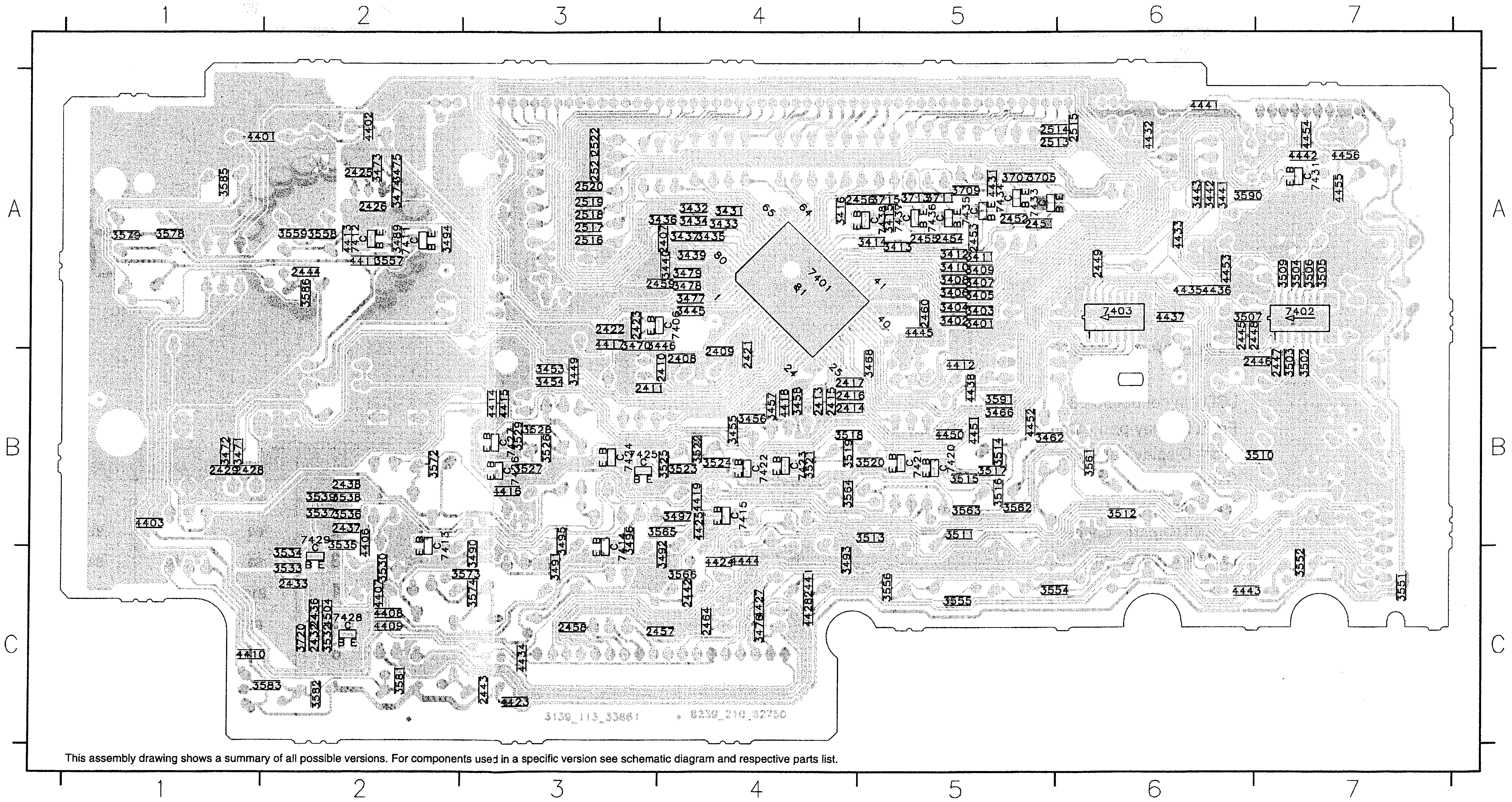
	A3	9426	B2	9440	B4	9451	C4	9464	C6	9476	A5	9489	A7
	A3	9427	B1	9441	B4	9452	C4	9465	C6	9477	A5	9491	A7
	A3	9428	B2	9442	B4	9453	C4	9467	C6	9478	A5	9492	A7
	A3	9429	B2	9443	B4	9455	C5	9468	B6	9481	A5	9495	B7
	B2	9430	B2	9445	B4	9456	C5	9469	B6	9482	A5	9496	B7
	A2	9432	A7	9446	B5	9457	C5	9471	A5	9483	A5	9497	B7
	B2	9434	B3	9447	B5	9458	B5	9472	A5	9484	B5	9498	A5
	B1	9435	B3	9448	B5	9461	B5	9473	A5	9485	B5	9500	B5
	B1	9436	B3	9449	B5	9462	C5	9474	A5	9486	B6	9516	B2
	B2	9437	B3	9450	A1	9463	C6	9475	A5	9488	B6		



FRONT DISPLAY BOARD - COPPER SIDE VIEW

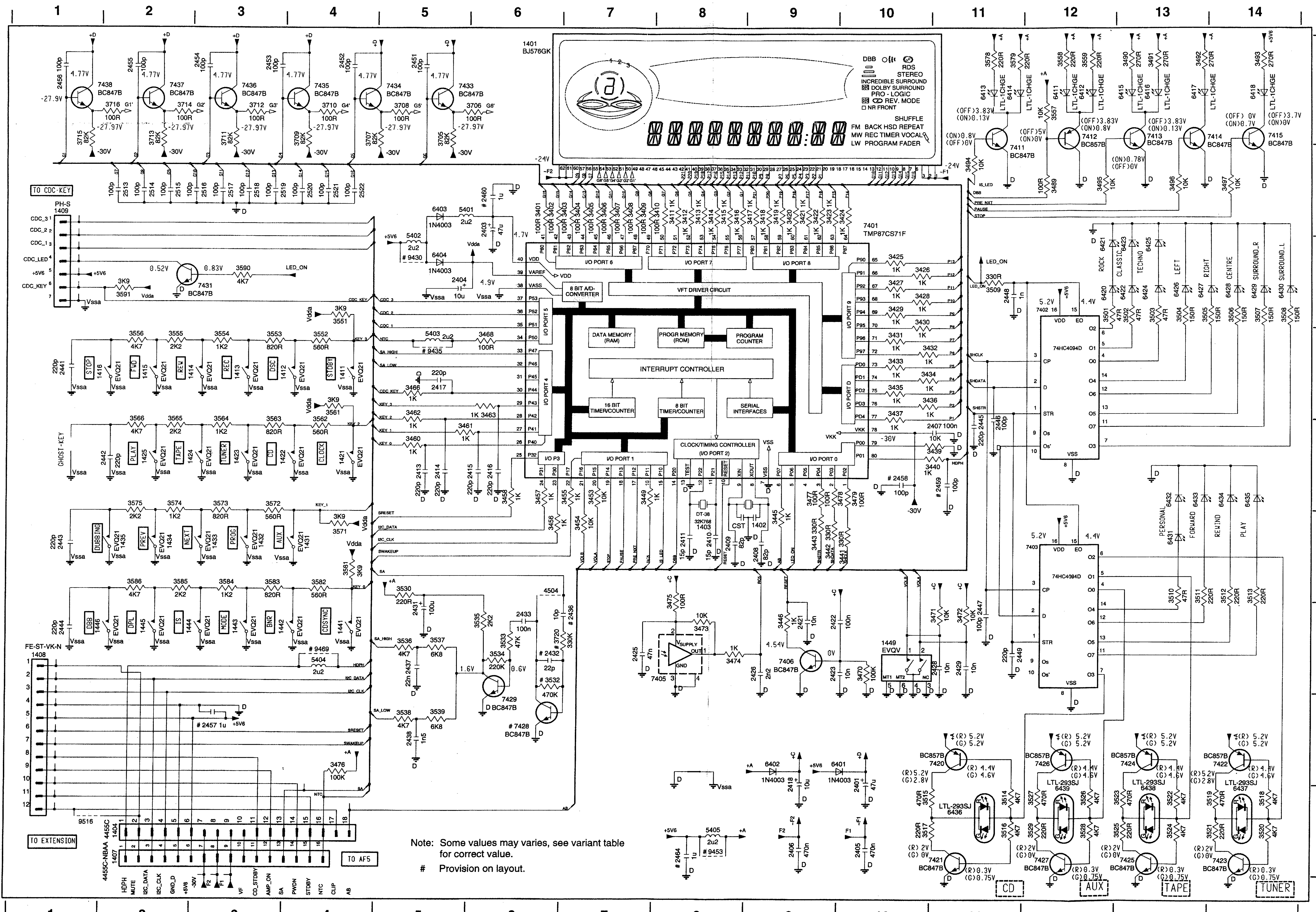
2407	A4	2426	A2	2447	B7	2513	A5	3405	A5	3433	A4	3454	B3	3476	C4	3503	B7
2408	B4	2428	B1	2448	A6	2514	A5	3406	A5	3434	A4	3455	B4	3477	A4	3504	A7
2409	B4	2429	B1	2449	A6	2515	A6	3407	A5	3435	A4	3456	B4	3478	A4	3505	A7
2410	B4	2432	C2	2451	A5	2516	A3	3408	A5	3436	A4	3457	B4	3479	A4	3506	A7
2411	B3	2433	C2	2452	A5	2517	A3	3409	A5	3437	A4	3458	B4	3489	A2	3507	A6
2413	B4	2436	C2	2453	A5	2518	A3	3410	A5	3439	A4	3462	B5	3490	C3	3509	A7
2414	B4	2437	B2	2454	A5	2519	A3	3411	A5	3440	A4	3466	B5	3491	C3	3510	B7
2415	B4	2438	B2	2455	A5	2520	A3	3412	A5	3441	A6	3468	B5	3492	C4	3511	B5
2416	B4	2441	C4	2456	A5	2521	A3	3413	A5	3442	A6	3470	A3	3493	C4	3512	B6
2417	B4	2442	C4	2457	C4	2522	A3	3414	A5	3443	A6	3471	B1	3494	A2	3513	B5
2421	B4	2443	C3	2458	C3	3401	A5	3415	A5	3445	A4	3472	B1	3495	B3	3514	B5
2422	A3	2444	A2	2459	A4	3402	A5	3416	A4	3446	A4	3473	A2	3496	B3	3515	B5
2423	A3	2445	A6	2460	A5	3403	A5	3431	A4	3449	B3	3474	A2	3497	B4	3516	B5
2425	A2	2446	B7	2464	C4	3404	A5	3432	A4	3453	B3	3475	A2	3502	B7	3517	B5

3518	B4	3533	C2	3559	A2	3583	C2	4403	B1	4419	B4	4441	A6	7402	A7	7426	B3
3519	B4	3534	C2	3561	B6	3585	A1	4406	B2	4423	C3	4442	A7	7403	A6	7427	B3
3520	B5	3535	B2	3562	B5	3586	A2	4407	C2	4424	C4	4443	C6	7406	A4	7428	C2
3521	B4	3536	B2	3563	B5	3590	A6	4408	C2	4425	B4	4444	C4	7411	A2	7429	B2
3522	B4	3537	B2	3564	B4	3591	B5	4409	C2	4427	C4	4445	A5	7412	A2	7431	A7
3523	B4	3538	B2	3565	B4	3705	A5	4410	C1	4428	C4	4450	B5	7413	B2	7433	A5
3524	B4	3539	B2	3566	C4	3707	A5	4411	A2	4431	A5	4451	B5	7414	C3	7434	A5
3525	B4	3551	C7	3572	B2	3709	A5	4412	B5	4432	A6	4452	B5	7415	B4	7435	A5
3526	B3	3552	C7	3573	C3	3711	A5	4413	A2	4433	A6	4453	A6	7420	B5	7436	A5
3527	B3	3554	C5	3574	C3	3713	A5	4414	B3	4434	C3	4454	A7	7421	B5	7437	A5
3528	B3	3555	C5	3578	A1	3715	A5	4415	B3	4435	A6	4455	A7	7422	B4	7438	A5
3529	B3	3556	C5	3579	A1	3720	C2	4416	B3	4436	A6	4456	A7	7423	B4		
3530	C2	3557	A2	3581	C2	4401	A1	4417	A3	4437	A6	4504	C2	7424	B3		
3532	C2	3558	A2	3582	C2	4402	A2	4418	B4	4438	B5	7401	A4	7425	B3		



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

CIRCUIT DIAGRAM - FRONT DISPLAY PART

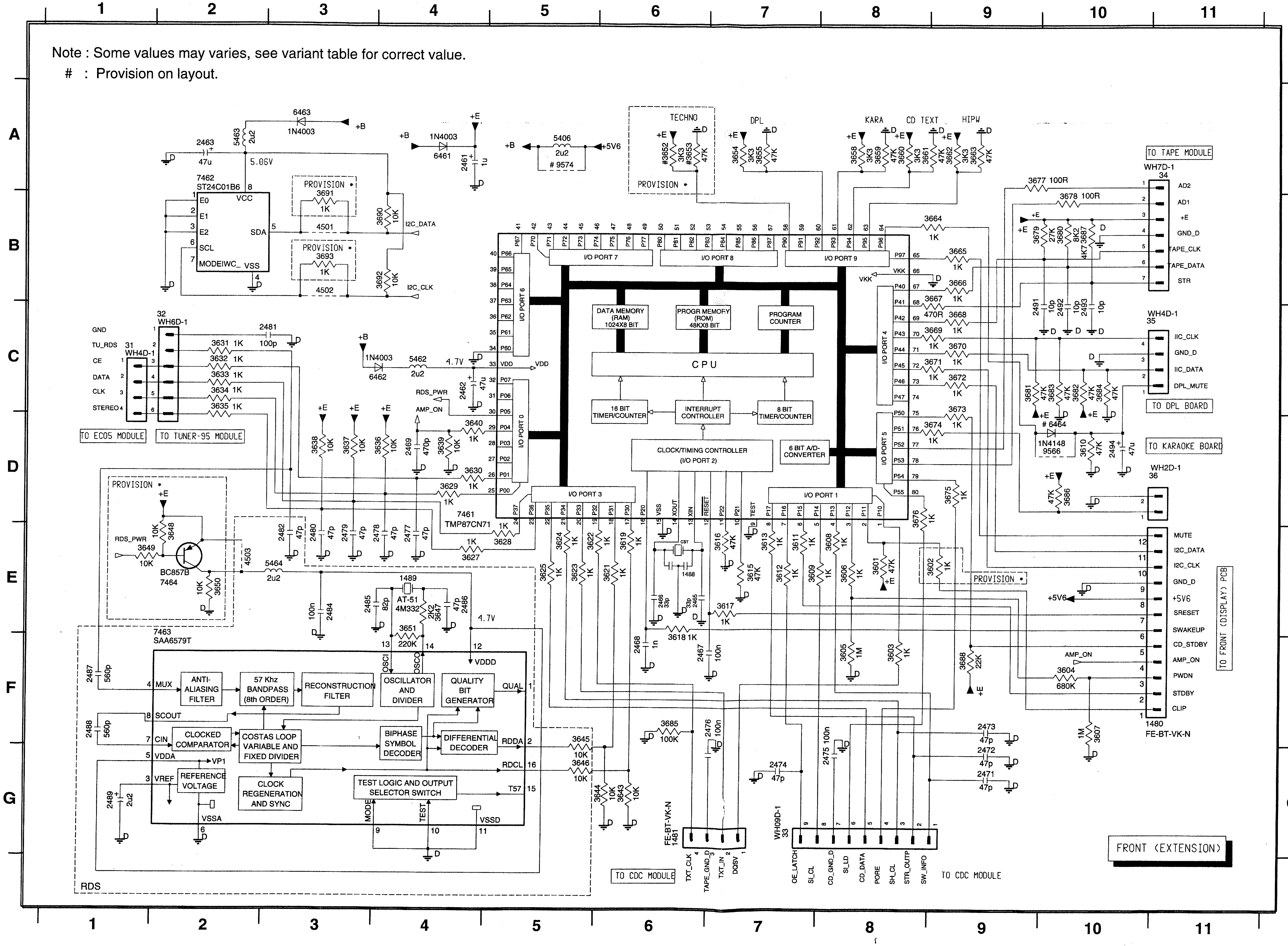

1401
BJ576GK
DBB
RDS
STEREO
INCREDIBLE SURROUND
DOLBY SURROUND
PRO - LOGIC
REV. MODE
NR FRONT
SHUFFLE
FM BACK HSD REPEAT
MW REC TIMER VOCAL
LW PROGRAM FADER
7401
TMP87CS71F
I/O PORT 6
I/O PORT 7
I/O PORT 8
8 BIT A/D-CONVERTER
VFT DRIVER CIRCUIT
DATA MEMORY (RAM)
PROGR MEMORY (ROM)
PROGRAM COUNTER
INTERRUPT CONTROLLER
16 BIT TIMER/COUNTER
8 BIT TIMER/COUNTER
SERIAL INTERFACES
CLOCK/TIMING CONTROLLER (I/O PORT 2)
I/O PORT 1
I/O PORT 0
I/O PORT 5
I/O PORT 4
I/O PORT 9
I/O PORT D
I/O P3
TO CDC-KEY
PH-S 1409
CDC_3
CDC_2
CDC_1
CDC_LED
+5V6
CDC_KEY
LED_ON
GHOST-KEY
STOP
FWD
REW
REC
DSC
STDBY
PLAY
TAPE
TUNER
CD
CLOCK
DUBBING
PREV
NEXT
PROG
AUX
DBB
DPL
IS
MODE
BNR
CDSYNC
EVQ21
FE-ST-VK-N 1408
TO EXTENSION
TO AF5
4455C-NBAA 4455C 1404 1407
HDPH
MUTE
I2C_DATA
I2C_CLK
GND_D
+5V6
-30V
F2
F1
VF
CD_STDBY
AMP_ON
SA
PWDN
STDBY
NTC
CLIP
AB
ROCK
CLASSIC
TECHNO
LEFT
RIGHT
CENTRE
SURROUND_R
SURROUND_L
PERSONAL
FORWARD
REWIND
PLAY
74HC4094D
7402
7403
LTL-1CHGE
LTL-293SJ
BC847B
BC857B
1449 EVQV
7405
7406
CD
AUX
TAPE
TUNER

Note: Some values may varies, see variant table for correct value.

# Provision on layout.

1401	A6
1402	F9
1403	F8
1404	I2
1407	I2
1408	G1
1409	B1
1411	D4
1412	D3
1413	D3
1414	D2
1415	D2
1416	D1
1421	E4
1422	E3
1423	E3
1424	E2
1425	E2
1431	F4
1432	F3
1433	F3
1434	F2
1435	F2
1441	G4
1442	G3
1443	G3
1444	G2
1445	G2
1446	G1
1449	G10
2401	I10
2403	B6
2404	C5
2405	I10
2406	I9
2407	E11
2408	F9
2409	F8
2410	F8
2411	F8
2413	E5
2414	E5
2415	E6
2416	E6
2417	D5
2418	I9
2421	G9
2422	G9
2423	G9
2425	G7
2426	G9
2428	G11
2429	G11
2431	G5
2432	G6
2433	G6
2436	G7
2437	G5
2438	H5
2441	D1
2442	E2
2443	F1
2444	G1
2445	E11
2446	E11
2447	G11
2448	C11
2449	G11
2451	A5
2452	A4
2453	A3
2454	A2
2455	A2
2456	A1
2457	H3
2458	E10
2459	E11
2460	B6
2464	I8
2513	B2
2514	B2
2515	B2
2516	B3
2517	B3
2518	B3
2519	B3
2520	B4
2521	B4
2522	B4
3401	B6
3402	B6
3403	B6
3404	B7
3405	B7
3406	B7
3407	B7
3408	B7
3409	B7
3410	B7
3411	B8
3412	B8
3413	B8
3414	B8
3415	B8
3416	B8
3417	B9
3418	B9
3419	B9
3420	B9
3421	B9
3422	B9
3423	B9
3424	B10
3425	C10
3426	C10
3427	C10
3428	C10
3429	C10
3430	C10
3431	D10
3432	D10
3433	D10
3434	D10
3435	D10
3436	D10
3437	D10
3439	E11
3440	E11
3441	F10
3442	F9
3443	F9
3445	F9
3446	G9
3449	E7
3453	E7
3454	F7
3455	E7
3456	F6
3457	E6
3458	E6
3460	E5
3461	E5
3462	D5
3463	D6
3466	D5
3468	D6
3470	G10
3471	G11
3472	G11
3473	G8
3474	G8
3475	G8
3476	H4
3477	E9
3478	E9
3479	E10
3489	B12
3490	A13
3491	A13
3492	A13
3493	A14
3494	B11
3495	B12
3496	B13
3497	B14
3501	C12
3502	C13
3503	C13
3504	C13
3505	C13
3506	C14
3507	C14
3508	C14
3509	C11
3510	F13
3511	F13
3512	F14
3513	F14
3514	I11
3515	I10
3516	I11
3517	I10
3518	I14
3519	I14
3520	I14
3521	I14
3522	I13
3523	I13
3524	I13
3525	I13
3526	I12
3527	I12
3528	I12
3529	I12
3530	F5
3532	G6
3533	G6
3534	G6
3535	G6
3536	G5
3537	G5
3538	H5
3539	H5
3551	C4
3552	D4
3553	D3
3554	D3
3555	D2
3556	D2
3557	A12
3558	A12
3559	A12
3561	D4
3562	E4
3563	E3
3564	E3
3565	E2
3566	E2
3571	F4
3572	E3
3573	E3
3574	E2
3575	E2
3578	A11
3579	A11
3581	F4
3582	F4
3583	F3
3584	F3
3585	F2
3586	F2
3590	C3
3591	C2
3705	A5
3706	A6
3707	A4
3708	A5
3709	A4
3710	A4
3711	A3
3712	A3
3713	A2
3714	A2
3715	A1
3716	A2
3720	G6
4504	F6
5401	B5
5402	C5
5403	D5
5404	G4
5405	I8
6401	H10
6402	H9
6403	B5
6404	C5
6411	A12
6412	A12
6413	A11
6414	A11
6415	A13
6416	A13
6417	A13
6418	A14
6420	C12
6421	C12
6422	C13
6423	C13
6424	C13
6425	C13
6426	C13
6427	C13
6428	C14
6429	C14
6430	C14
6431	F13
6432	E13
6433	E13
6434	E14
6435	E14
6436	I11
6437	I14
6438	I13
6439	I12
7401	B10
7402	C12
7403	F12
7405	G8
7406	G9
7411	B11
7412	A12
7413	A13
7414	A13
7415	A14
7420	H11
7421	I11
7422	H14
7423	I14
7424	H13
7425	I13
7426	H12
7427	I12
7428	H6
7429	H6
7431	C3
7433	A5
7434	A5
7435	A4
7436	A3
7437	A2
7438	A1
9430	C5
9435	D5
9453	I8
9469	G4
9516	I1

CIRCUIT DIAGRAM - SANDWICH PART

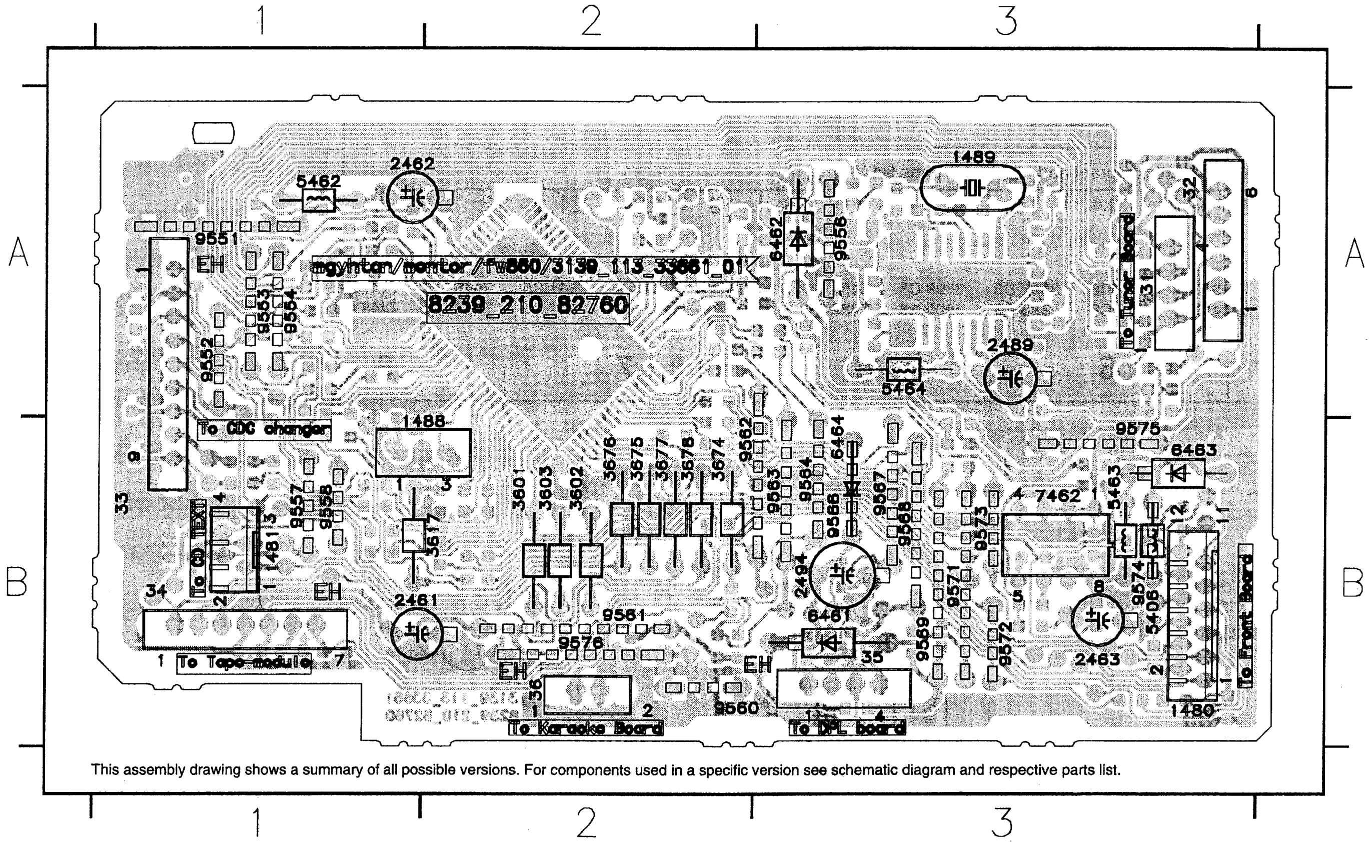

Note : Some values may varies, see variant table for correct value.
: Provision on layout.

1 2 3 4 5 6 7 8 9 10 11
A B C D E F G
7462 ST24C01B6
E0 E1 E2 SCL MODEIWC_ VCC SDA VSS
5.06V
6463 1N4003
6461 1N4003
5406 2u2 # 9574
+5V6
PROVISION 3691 1K 4501
PROVISION 3693 1K 4502
3690 10K I2C_DATA
3692 10K I2C_CLK
TECHNO #3652 3K3 #3653 47K PROVISION
DPL 3654 3K3 3655 47K
KARA CD TEXT HIPW
3658 3K3 3659 47K 3660 3K3 3661 47K 3662 3K3 3663 47K
TO TAPE MODULE
WH7D-1 34
AD2 AD1 +E GND_D TAPE_CLK TAPE_DATA STR
3677 100R 3678 100R
3679 27K 3680 8K2 3687 4K7
2491 10p 2492 10p 2493 10p
WH4D-1 35
IIC_CLK GND_D IIC_DATA DPL_MUTE
3681 47K 3683 47K 3682 47K 3684 47K
TO DPL BOARD
# 6464 1N4148 9566
3610 47K 2494 47u
TO KARAOKE BOARD
WH2D-1 36
3686 47K
7461 TMP87CN71
I/O PORT 7 I/O PORT 8 I/O PORT 9 I/O PORT 6 I/O PORT 4 I/O PORT 5 I/O PORT 0 I/O PORT 3 I/O PORT 1
DATA MEMORY (RAM) 1024X8 BIT
PROGR MEMORY (ROM) 48KX8 BIT
PROGRAM COUNTER
CPU
16 BIT TIMER/COUNTER
INTERRUPT CONTROLLER
8 BIT TIMER/COUNTER
CLOCK/TIMING CONTROLLER (I/O PORT 2)
6 BIT A/D-CONVERTER
VDD VKK VSS XOUT XIN RESET TEST
3664 1K 3665 1K 3666 1K 3667 470R 3668 1K 3669 1K 3670 1K 3671 1K 3672 1K 3673 1K 3674 1K 3675 1K 3676 1K
GND TU_RDS CE DATA CLK STEREO
31 WH4D-1
32 WH6D-1
TO EC05 MODULE
TO TUNER-95 MODULE
2481 100p
3631 1K 3632 1K 3633 1K 3634 1K 3635 1K
1N4003 6462 5462 2u2 4.7V 2462 47u
RDS_PWR AMP_ON
3638 10K 3637 10K 3636 10K 2469 470p 3639 10K 3640 1K
3630 1K 3629 1K 3628 1K 3627 1K
PROVISION
3648 10K 3649 10K BC857B 7464 3650 10K RDS_PWR
4503 5464 2u2
2482 47p 2480 47p 2479 47p 2478 47p 2477 47p
2484 100n
1489 AT-51 4M332 2485 82p 3647 2K2 2486 47p 3651 220K
4.7V
7463 SAA6579T
MUX ANTI-ALIASING FILTER
57 Khz BANDPASS (8th ORDER)
RECONSTRUCTION FILTER
OSCILLATOR AND DIVIDER
QUALITY BIT GENERATOR
QUAL
SCOUT CIN VDDA VREF VDDD VP1
CLOCKED COMPARATOR
COSTAS LOOP VARIABLE AND FIXED DIVIDER
BIPHASE SYMBOL DECODER
DIFFERENTIAL DECODER
RDDA RDCL T57
REFERENCE VOLTAGE
CLOCK REGENERATION AND SYNC
TEST LOGIC AND OUTPUT SELECTOR SWITCH
MODE TEST VSSA VSSD
2487 560p 2488 560p 2489 2u2
RDS
3645 10K 3646 10K 3644 10K 3643 10K
3624 1K 3625 1K 3622 1K 3623 1K 3619 1K 3621 1K
2465 33p 2466 33p 1488
3616 47K 3615 47K 3617 1K 3618 1K
2468 1n 2467 100n
3613 1K 3612 1K 3611 1K 3609 1K 3608 1K 3606 1K 3601 47K 3602 1K
3605 1M 3603 1K 3688 22K
PROVISION
3685 100K 2476 100n 2475 100n 2474 47p
2473 47p 2472 47p 2471 47p
MUTE I2C_DATA I2C_CLK GND_D +5V6 SRESET SWAKEUP CD_STDBY AMP_ON PWDN STDBY CLIP
AMP_ON 3604 680K 3607 1M
1480 FE-BT-VK-N
TO FRONT (DISPLAY) PCB
FE-BT-VK-N 1481
TXT_CLK TAPE_GND_D TXT_IN DOSV
TO CDC MODULE
WH09D-1 33
OE_LATCH SI_CL CD_GND_D SI_LD CD_DATA PORE SH_CL STR_OUTP SW_INFO
TO CDC MODULE
FRONT (EXTENSION)

31	C1
32	C2
33	G7
34	A11
35	C10
36	D10
1480	F10
1481	G6
1488	E6
1489	E4
2461	A4
2462	C4
2463	A2
2465	E6
2466	E6
2467	F6
2468	F6
2469	D4
2471	G9
2472	G9
2473	F9
2474	G7
2475	G8
2476	F7
2477	E4
2478	E4
2479	E3
2480	E3
2481	C3
2482	E3
2484	E3
2485	E3
2486	E4
2487	F1
2488	F1
2489	G1
2491	C9
2492	C10
2493	C10
2494	D10
3601	E8
3602	E9
3603	F8
3604	F10
3605	F8
3606	E8
3607	F10
3608	E8
3609	E7
3610	D10
3611	E7
3612	E7
3613	E7
3615	E7
3616	E7
3617	E7
3618	E6
3619	E6
3621	E6
3622	E5
3623	E5
3624	E5
3625	E5
3627	E4
3628	E5
3629	D4
3630	D4
3631	C2
3632	C2
3633	C2
3634	C2
3635	C2
3636	D4
3637	D3
3638	D3
3639	D4
3640	D4
3643	G6
3644	G6
3645	F5
3646	G5
3647	E4
3648	E2
3649	E1
3650	E2
3651	E4
3652	A6
3653	A6
3654	A7
3655	A7
3658	A8
3659	A8
3660	A8
3661	A8
3662	A9
3663	A9
3664	B9
3665	B9
3666	B9
3667	B9
3668	C9
3669	C9
3670	C9
3671	C9
3672	C9
3673	C9
3674	D9
3675	D9
3676	D8
3677	A9
3678	B10
3679	B9
3680	B10
3681	C9
3682	C10
3683	C10
3684	C10
3685	F6
3686	D10
3687	B10
3688	F9
3690	B4
3691	B3
3692	B4
3693	B3
4501	B3
4502	B3
4503	E2
5406	A5
5462	C4
5463	A2
5464	E3
6461	A4
6462	C4
6463	A3
6464	D10
7461	D4
7462	A2
7463	F2
7464	E2
9566	D10
9574	A5

SANDWICH BOARD - COMPONENT VIEW

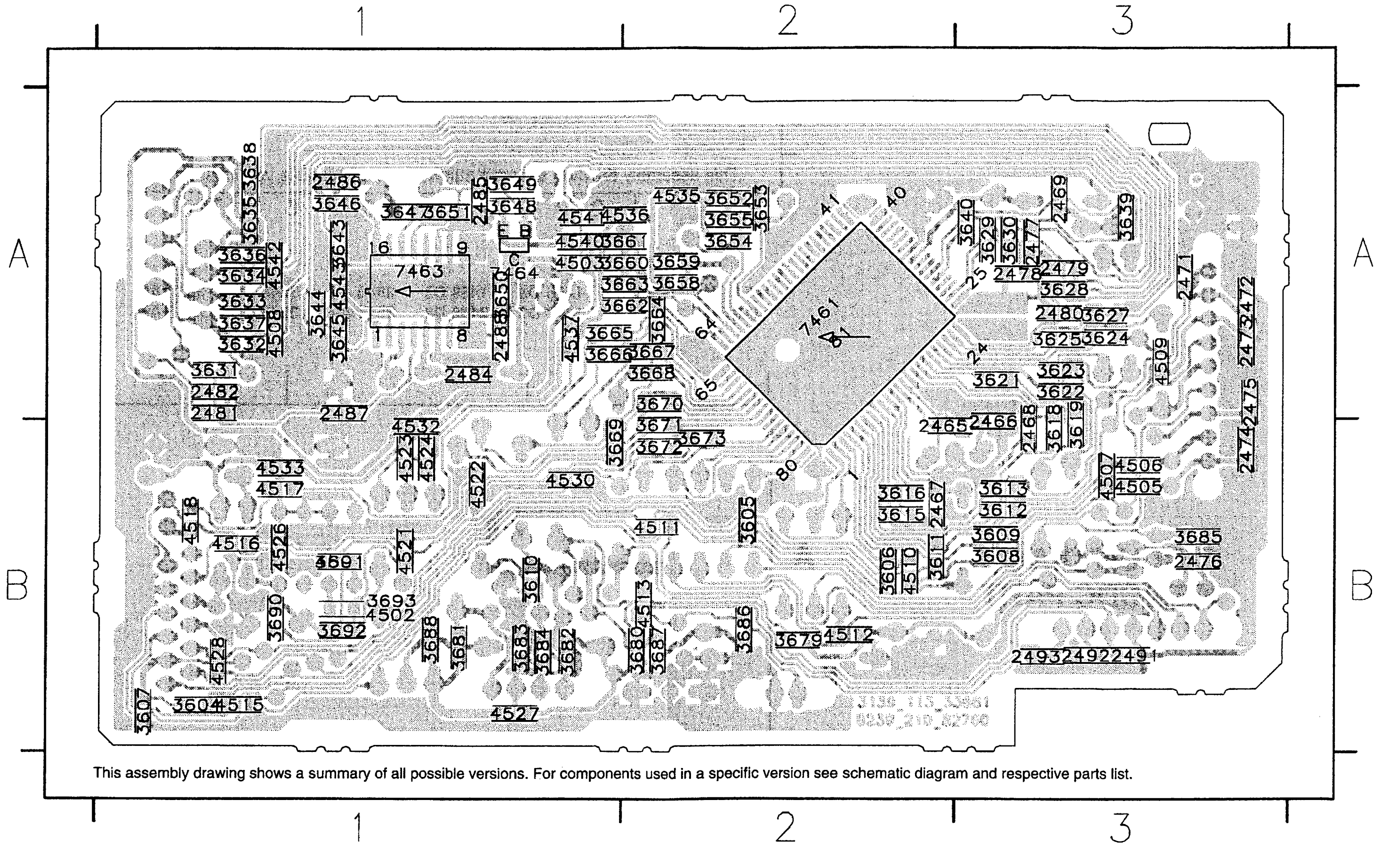
31	A3	1480	B3	2463	B3	3674	B2	5463	B3	9551	A1	9558	B1	9566	B3	9573	B3
32	A3	1481	B1	2489	A3	3675	B2	5464	A3	9552	A1	9560	B2	9567	B3	9574	B3
33	B1	1488	B1	3601	B2	3676	B2	6461	B3	9553	A1	9561	B2	9568	B3	9575	A3
34	B1	1489	A3	3602	B2	3677	B2	6462	A3	9554	A1	9562	B3	9569	B3	9576	B2
35	B3	2461	B1	3603	B2	3678	B2	6463	B3	9556	A3	9563	B3	9571	B3		
36	B2	2462	A1	3617	B2	5462	A1	7462	B3	9557	B1	9564	B3	9572	B3		


1
2
3
A
B
mgyhtan/mentor/fw880/3139_113_33861_01
8239_210_82760
To CDC changer
To CD TEXT
To Tape module
To Karaoke Board
To DPL board
To Front Board
To Tuner Board
EH
1480
1481
1488
1489
2461
2462
2463
2489
2494
5462
5464
5463
6461
6462
6463
7462

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

SANDWICH BOARD - COPPER SIDE VIEW

2465	B2	2480	A3	3607	B1	3625	A3	3640	A3	3656	A2	3670	A2	3690	B1	4512	B2	4533	B1
2466	B3	2481	A1	3608	B3	3627	A3	3643	A1	3657	A2	3671	B2	3691	B1	4515	B1	4535	A2
2467	B2	2482	A1	3609	B3	3628	A3	3644	A1	3658	A2	3672	B2	3692	B1	4516	B1	4536	A2
2468	B3	2484	A1	3611	B2	3629	A3	3645	A1	3659	A2	3673	B2	3693	B1	4517	B1	4537	A1
2469	A3	2485	A1	3612	B3	3630	A3	3646	A1	3660	A2	3679	B2	4501	B1	4518	B1	4540	A1
2471	A3	2486	A1	3613	B3	3631	A1	3647	A1	3661	A2	3680	B2	4502	B1	4521	B1	4541	A1
2472	A3	2487	A1	3615	B2	3632	A1	3648	A1	3662	A2	3681	B1	4503	A1	4522	B1	4542	A1
2473	A3	2488	A1	3616	B2	3633	A1	3649	A1	3663	A2	3682	B1	4505	B3	4523	B1	4543	A1
2474	B3	2491	B3	3618	B3	3634	A1	3650	A1	3664	A2	3683	B1	4506	B3	4524	B1	7461	A2
2475	A3	2492	B3	3619	B3	3635	A1	3651	A1	3665	A1	3684	B1	4507	B3	4526	B1	7463	A1
2476	B3	2493	B3	3621	A3	3636	A1	3652	A2	3666	A1	3685	B3	4508	A1	4527	B1	7464	A1
2477	A3	3604	B1	3622	A3	3637	A1	3653	A2	3667	A2	3686	B2	4509	A3	4528	B1		
2478	A3	3605	B2	3623	A3	3638	A1	3654	A2	3668	A2	3687	B2	4510	B2	4530	B1		
2479	A3	3606	B2	3624	A3	3639	A3	3655	A2	3669	B1	3688	B1	4511	B2	4532	B1		

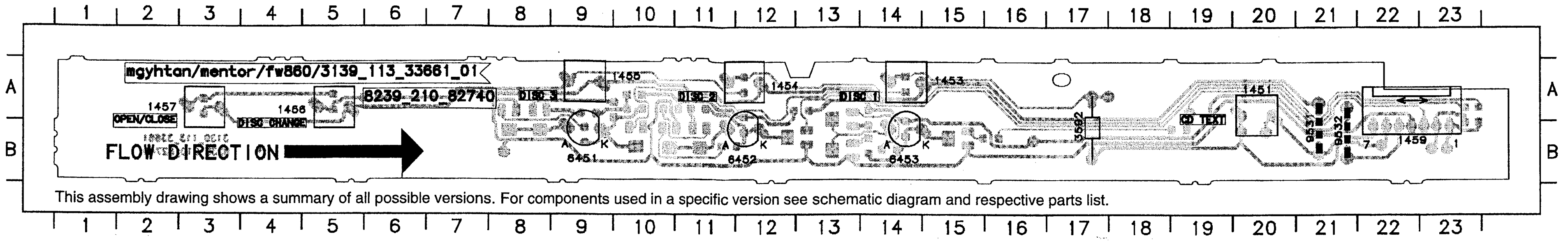

1
2
3
A
B
7461
7463
2486
3646
2484
2487
4530
4511
3679
4512
4527
3604
4515
3607
2493
2492
2491
3685
2476
2465
2466

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

KEY-CDC PART

KEY-CDC BOARD - COMPONENT VIEW

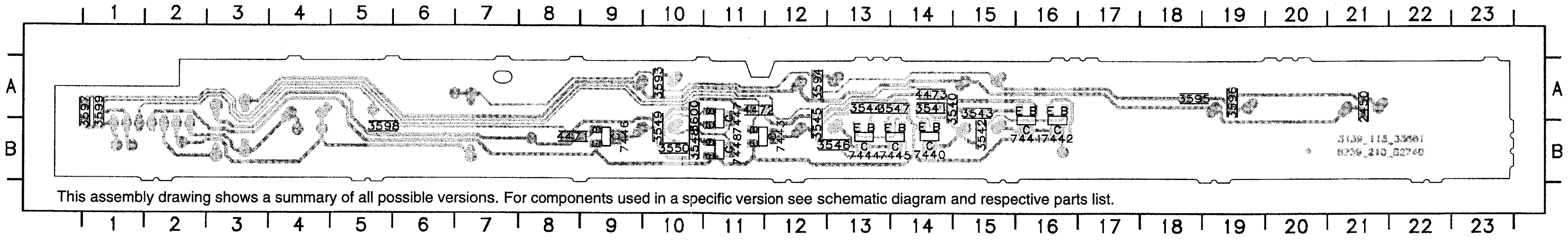
Item	Location
1451	A20
1453	A15
1454	A12
1455	A10
1456	A4
1457	A2
1459	B22
3592	B17
6451	B9
6452	B12
6453	B14
9531	B21
9532	B21


mgyhtan/mentor/fw860/3139_113_33661_01
8239 210 62740
FLOW DIRECTION
OPEN/CLOSE
DISC CHANGE
DISC 3
DISC 2
DISC 1
CD TEXT
1451
1453
1454
1455
1456
1457
1459
6451
6452
6453
3592
A
B

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

KEY-CDC BOARD - COPPER SIDE VIEW

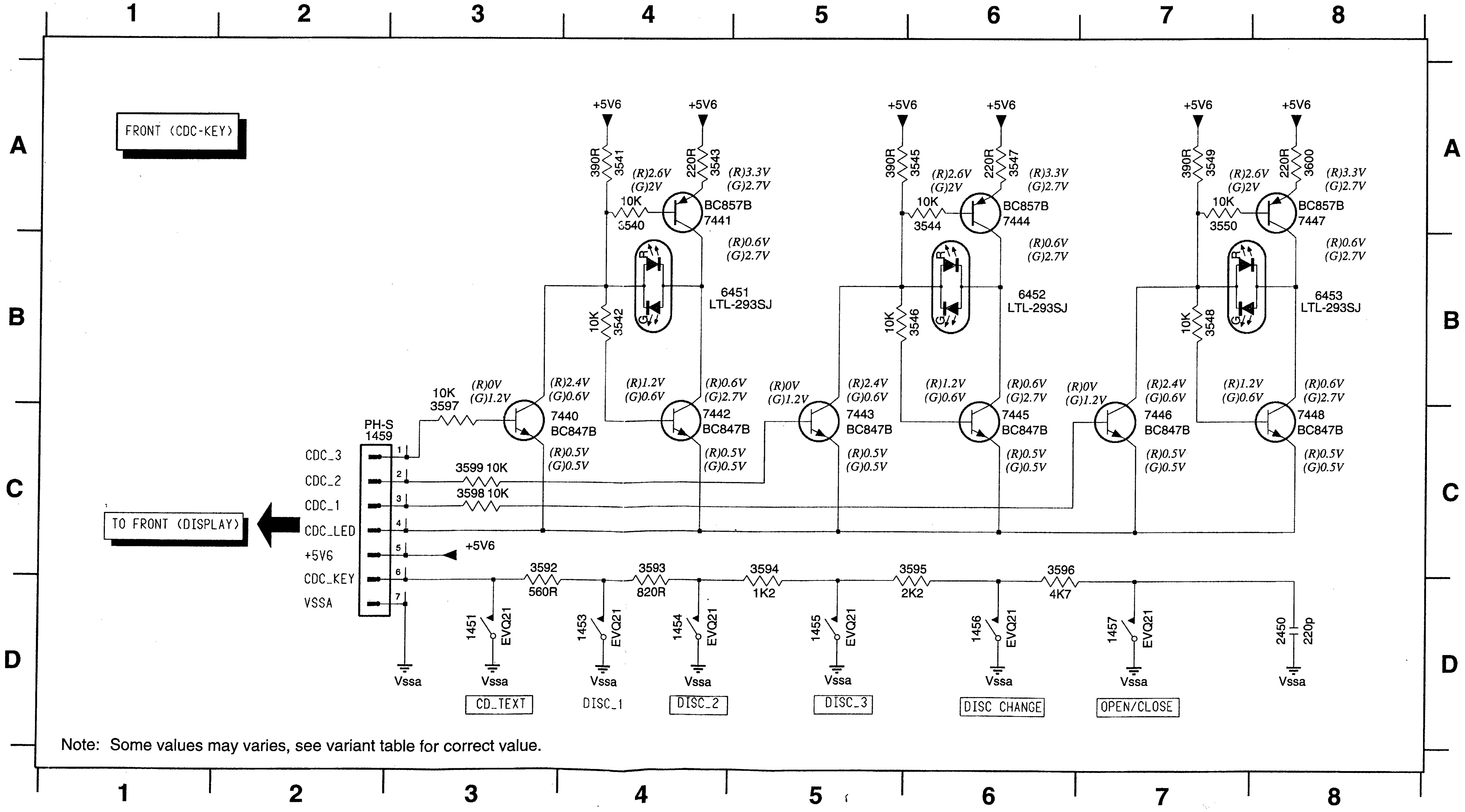
Item	Location
2450	A21
3540	A14
3541	A14
3542	B15
3543	A15
3544	A13
3545	B12
3546	B13
3547	A14
3548	B10
3549	B10
3550	B10
3593	A10
3594	A12
3595	A18
3596	A19
3597	A1
3598	B5
3599	A1
3600	A10
4471	B8
4472	A11
4473	A14
7440	B14
7441	B16
7442	B16
7443	B12
7444	B13
7445	B14
7446	B9
7447	A11
7448	B11


3139_113_33661
8239_210_62740
A
B

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

CIRCUIT DIAGRAM - KEY-CDC PART

Item	Location
1451	D3
1453	D4
1454	D4
1455	D5
1456	D6
1457	D7
1459	C3
2450	D8
3540	A4
3541	A4
3542	B4
3543	A4
3544	A6
3545	A6
3546	B6
3547	A6
3548	B7
3549	A7
3550	A7
3592	C3
3593	C4
3594	C5
3595	C6
3596	C6
3597	C3
3598	C3
3599	C3
3600	A8
6451	B5
6452	B6
6453	B8
7440	C3
7441	A4
7442	C4
7443	C5
7444	A6
7445	C6
7446	C7
7447	A8
7448	C8


FRONT (CDC-KEY)
TO FRONT (DISPLAY)
PH-S 1459
CDC_3
CDC_2
CDC_1
CDC_LED
+5V6
CDC_KEY
VSSA
+5V6
390R 3541
220R 3543
10K 3540
BC857B 7441
(R)2.6V (G)2V
(R)3.3V (G)2.7V
(R)0.6V (G)2.7V
6451 LTL-293SJ
10K 3542
10K 3597
(R)0V (G)1.2V
(R)2.4V (G)0.6V
7440 BC847B
(R)1.2V (G)0.6V
7442 BC847B
(R)0.5V (G)0.5V
390R 3545
220R 3547
10K 3544
BC857B 7444
6452 LTL-293SJ
10K 3546
7443 BC847B
7445 BC847B
390R 3549
220R 3600
10K 3550
BC857B 7447
6453 LTL-293SJ
10K 3548
7446 BC847B
7448 BC847B
3599 10K
3598 10K
3592 560R
3593 820R
3594 1K2
3595 2K2
3596 4K7
1451 EVQ21
1453 EVQ21
1454 EVQ21
1455 EVQ21
1456 EVQ21
1457 EVQ21
2450 220p
Vssa
CD_TEXT
DISC_1
DISC_2
DISC_3
DISC CHANGE
OPEN/CLOSE
1 2 3 4 5 6 7 8
A B C D

Note: Some values may varies, see variant table for correct value.

ELECTRICAL PARTS LIST - FRONT BOARD

MISCELLANEOUS

1401	4822 135 00167	FTD Display BJ576GK-C
1402	4822 242 72527	Ceram Resonator 4MHz
1403	4822 242 70938	X'tal Resonator 32,768kHz
1404	4822 267 10736	Socket 18 pin
1408	4822 267 51453	Flex Cable Socket 12 pin
1411	4822 276 13114	Tact Switch
1412	4822 276 13114	Tact Switch
1413	4822 276 13114	Tact Switch
1414	4822 276 13114	Tact Switch
1415	4822 276 13114	Tact Switch
1416	4822 276 13114	Tact Switch
1421	4822 276 13114	Tact Switch
1422	4822 276 13114	Tact Switch
1423	4822 276 13114	Tact Switch
1424	4822 276 13114	Tact Switch
1425	4822 276 13114	Tact Switch
1431	4822 276 13114	Tact Switch
1432	4822 276 13114	Tact Switch
1433	4822 276 13114	Tact Switch
1434	4822 276 13114	Tact Switch
1435	4822 276 13114	Tact Switch
1441	4822 276 13114	Tact Switch
1442	4822 276 13114	Tact Switch
1443	4822 276 13114	Tact Switch
1444	4822 276 13114	Tact Switch
1446	4822 276 13114	Tact Switch
1449	4822 101 21261	Rotary Encoder 24P
1451	4822 276 13114	Tact Switch
1453	4822 276 13114	Tact Switch
1454	4822 276 13114	Tact Switch
1455	4822 276 13114	Tact Switch
1456	4822 276 13114	Tact Switch
1457	4822 276 13114	Tact Switch
1480	4822 267 10732	Flex Cable Socket 12 pin
1481	4822 267 10733	Flex Cable Socket 4 pin
1488	4822 242 72066	Ceram Resonator 8MHz
1489	4822 242 72195	Quartz 4,332MHz

CAPACITORS

2401	4822 124 80483	47µF 20% 6,3V
2403	4822 124 80483	47µF 20% 6,3V
2404	4822 124 11947	10µF 20% 16V
2405	4822 121 51252	470nF 5% 63V
2406	4822 121 51252	470nF 5% 63V
2407	4822 126 10002	100nF 20% 25V
2408	4822 126 13695	82pF 1% 63V
2409	4822 126 13695	82pF 1% 63V
2410	4822 122 32504	15pF 2% 63V
2411	4822 122 32504	15pF 2% 63V
2413	4822 122 33575	220pF 5% 50V
2414	4822 122 33575	220pF 5% 50V
2415	4822 122 33575	220pF 5% 50V
2416	4822 122 33575	220pF 5% 50V
2417	4822 122 33575	220pF 5% 50V
2418	4822 124 40998	22µF 20% 6,3V
2421	4822 122 33177	10nF 20% 50V
2422	4822 126 13838	100nF +80/-20% 50V
2423	4822 122 33177	10nF 20% 50V
2425	4822 126 12944	47nF 10% 50V
2426	4822 122 33175	2,2nF 20% 50V
2428	4822 122 33177	10nF 20% 50V
2429	4822 122 33177	10nF 20% 50V
2431	4822 124 41584	100µF 20% 10V
2433	4822 126 13296	100nF 10% 16V
2437	5322 122 32654	22nF 10% 63V
2438	5322 122 31865	1,5nF 10% 63V
2441	4822 122 33575	220pF 5% 50V
2442	4822 122 33575	220pF 5% 50V
2443	4822 122 33575	220pF 5% 50V
2444	4822 122 33575	220pF 5% 50V
2445	4822 122 33575	220pF 5% 50V
2446	5322 122 32531	100pF 5% 50V
2447	5322 122 32531	100pF 5% 50V
2448	5322 122 34123	1nF 10% 50V
2449	4822 122 33575	220pF 5% 50V
2450	4822 122 33575	220pF 5% 50V
2451	5322 122 32531	100pF 5% 50V
2452	5322 122 32531	100pF 5% 50V
2453	5322 122 32531	100pF 5% 50V
2454	5322 122 32531	100pF 5% 50V
2455	5322 122 32531	100pF 5% 50V
2456	5322 122 32531	100pF 5% 50V
2461	4822 124 40242	1µF 20% 63V
2462	4822 124 80483	47µF 20% 6,3V
2463	4822 124 40433	47µF 20% 25V
2465	5322 122 32659	33pF 5% 50V
2466	5322 122 32659	33pF 5% 50V
2467	4822 126 13838	100nF +80/-20% 50V
2468	5322 122 34123	1nF 10% 50V
2469	5322 122 34099	470pF 10% 63V
2471	4822 126 13692	47pF 1% 63V
2472	4822 126 13692	47pF 1% 63V
2473	4822 126 13692	47pF 1% 63V
2474	4822 126 13692	47pF 1% 63V
2475	4822 126 13296	100nF 10% 16V
2476	4822 126 13296	100nF 10% 16V
2477	4822 126 13692	47pF 1% 63V
2478	4822 126 13692	47pF 1% 63V
2479	4822 126 13692	47pF 1% 63V
2480	4822 126 13692	47pF 1% 63V
2481	5322 122 32531	100pF 5% 50V
2482	4822 126 13692	47pF 1% 63V
2484	4822 126 13296	100nF 10% 16V
2485	4822 126 13695	82pF 1% 63V

ELECTRICAL PARTS LIST - FRONT BOARD

2486	4822 126 13692	47pF 1% 63V
2487	4822 122 33173	560pF 10% 50V
2488	4822 122 33173	560pF 10% 50V
2489	4822 124 41576	2,2µF 20% 50V
2491	5322 122 32448	10pF 5% 50V
2492	5322 122 32448	10pF 5% 50V
2493	5322 122 32448	10pF 5% 50V
2513	5322 122 32531	100pF 5% 50V
2514	5322 122 32531	100pF 5% 50V
2515	5322 122 32531	100pF 5% 50V
2516	5322 122 32531	100pF 5% 50V
2517	5322 122 32531	100pF 5% 50V
2518	5322 122 32531	100pF 5% 50V
2519	5322 122 32531	100pF 5% 50V
2520	5322 122 32531	100pF 5% 50V
2521	5322 122 32531	100pF 5% 50V
2522	5322 122 32531	100pF 5% 50V

RESISTORS

3401	4822 051 20101	100R 5% 0,1W
3402	4822 051 20101	100R 5% 0,1W
3403	4822 051 20101	100R 5% 0,1W
3404	4822 051 20101	100R 5% 0,1W
3405	4822 051 20101	100R 5% 0,1W
3406	4822 051 20101	100R 5% 0,1W
3407	4822 051 20101	100R 5% 0,1W
3408	4822 051 20101	100R 5% 0,1W
3409	4822 051 20101	100R 5% 0,1W
3410	4822 051 20101	100R 5% 0,1W
3411	4822 051 10102	1k 2% 0,25W
3412	4822 051 10102	1k 2% 0,25W
3413	4822 051 10102	1k 2% 0,25W
3414	4822 051 10102	1k 2% 0,25W
3415	4822 051 10102	1k 2% 0,25W
3416	4822 051 10102	1k 2% 0,25W
3417	4822 050 11002	1k 1% 0,4W
3418	4822 050 11002	1k 1% 0,4W
3419	4822 050 11002	1k 1% 0,4W
3420	4822 050 11002	1k 1% 0,4W
3421	4822 050 11002	1k 1% 0,4W
3422	4822 050 11002	1k 1% 0,4W
3423	4822 050 11002	1k 1% 0,4W
3424	4822 050 11002	1k 1% 0,4W
3425	4822 050 11002	1k 1% 0,4W
3426	4822 050 11002	1k 1% 0,4W
3427	4822 050 11002	1k 1% 0,4W
3428	4822 050 11002	1k 1% 0,4W
3429	4822 050 11002	1k 1% 0,4W
3430	4822 050 11002	1k 1% 0,4W
3431	4822 051 10102	1k 2% 0,25W
3432	4822 051 10102	1k 2% 0,25W
3433	4822 051 10102	1k 2% 0,25W
3434	4822 051 10102	1k 2% 0,25W
3435	4822 051 10102	1k 2% 0,25W
3436	4822 051 10102	1k 2% 0,25W
3437	4822 051 10102	1k 2% 0,25W
3439	4822 117 10833	10k 1% 0,1W
3440	4822 051 10102	1k 2% 0,25W
3441	4822 051 20331	330R 5% 0,1W
3442	4822 051 20331	330R 5% 0,1W
3443	4822 051 20331	330R 5% 0,1W
3445	4822 051 10102	1k 2% 0,25W
3446	4822 051 10102	1k 2% 0,25W
3449	4822 051 10102	1k 2% 0,25W
3453	4822 117 10833	10k 1% 0,1W
3454	4822 117 10833	10k 1% 0,1W
3455	4822 051 10102	1k 2% 0,25W
3456	4822 051 10102	1k 2% 0,25W
3457	4822 051 10102	1k 2% 0,25W
3458	4822 051 10102	1k 2% 0,25W
3460	4822 050 11002	1k 1% 0,4W
3461	4822 050 11002	1k 1% 0,4W
3462	4822 051 10102	1k 2% 0,25W
3463	4822 050 11002	1k 1% 0,4W
3466	4822 051 10102	1k 2% 0,25W
3468	4822 051 20101	100R 5% 0,1W
3470	4822 051 20104	100k 5% 0,1W
3471	4822 117 10833	10k 1% 0,1W
3472	4822 117 10833	10k 1% 0,1W
3473	4822 117 10833	10k 1% 0,1W
3474	4822 051 10102	1k 2% 0,25W
3475	4822 051 20101	100R 5% 0,1W
3476	4822 051 20104	100k 5% 0,1W
3477	4822 051 20101	100R 5% 0,1W
3478	4822 051 20101	100R 5% 0,1W
3479	4822 051 20101	100R 5% 0,1W
3489	4822 051 20101	100R 5% 0,1W
3490	4822 117 11504	270R 1% 0.1W
3491	4822 117 11504	270R 1% 0.1W
3492	4822 117 11504	270R 1% 0.1W
3493	4822 117 11504	270R 1% 0.1W
3494	4822 117 10833	10k 1% 0,1W
3495	4822 117 10833	10k 1% 0,1W
3496	4822 117 10833	10k 1% 0,1W
3497	4822 117 10833	10k 1% 0,1W
3501	4822 116 52195	47R 5% 0,5W
3502	4822 051 20479	47R 5% 0,1W
3503	4822 051 20479	47R 5% 0,1W
3509	4822 051 20331	330R 5% 0,1W
3510	4822 051 20479	47R 5% 0,1W
3511	4822 117 11503	220R 1% 0.1W
3512	4822 117 11503	220R 1% 0.1W
3513	4822 117 11503	220R 1% 0.1W
3514	4822 051 20472	4k7 5% 0,1W

ELECTRICAL PARTS LIST - FRONT BOARD

RESISTORS

3515	4822 051 20471	470R 5% 0,1W
3516	4822 051 20472	4k7 5% 0,1W
3517	4822 117 11503	220R 1% 0.1W
3518	4822 051 20472	4k7 5% 0,1W
3519	4822 051 20471	470R 5% 0,1W
3520	4822 051 20472	4k7 5% 0,1W
3521	4822 117 11503	220R 1% 0.1W
3522	4822 051 20472	4k7 5% 0,1W
3523	4822 051 20471	470R 5% 0,1W
3524	4822 051 20472	4k7 5% 0,1W
3525	4822 117 11503	220R 1% 0.1W
3526	4822 051 20472	4k7 5% 0,1W
3527	4822 051 20471	470R 5% 0,1W
3528	4822 051 20472	4k7 5% 0,1W
3529	4822 117 11503	220R 1% 0.1W
3530	4822 117 11503	220R 1% 0.1W
3533	4822 117 10834	47k 1% 0,1W
3534	4822 051 20224	220k 5% 0,1W
3535	4822 117 11449	2k2 1% 0,1W
3536	4822 051 20472	4k7 5% 0,1W
3537	4822 117 11507	6k8 1% 0,1W
3538	4822 051 20472	4k7 5% 0,1W
3539	4822 117 11507	6k8 1% 0,1W
3540	4822 117 10833	10k 1% 0,1W
3541	4822 051 20391	390R 5% 0,1W
3542	4822 117 10833	10k 1% 0,1W
3543	4822 117 11503	220R 1% 0.1W
3544	4822 117 10833	10k 1% 0,1W
3545	4822 051 20391	390R 5% 0,1W
3546	4822 117 10833	10k 1% 0,1W
3547	4822 117 11503	220R 1% 0.1W
3548	4822 117 10833	10k 1% 0,1W
3549	4822 051 20391	390R 5% 0,1W
3550	4822 117 10833	10k 1% 0,1W
3551	4822 051 20392	3k9 5% 0,1W
3552	4822 051 20561	560R 5% 0,1W
3553	4822 116 52231	820R 5% 0,5W
3554	4822 051 20122	1k2 5% 0,1W
3555	4822 117 11449	2k2 1% 0,1W
3556	4822 051 20472	4k7 5% 0,1W
3557	4822 117 10833	10k 1% 0,1W
3558	4822 117 11504	270R 1% 0.1W
3559	4822 117 11504	270R 1% 0.1W
3561	4822 051 20392	3k9 5% 0,1W
3562	4822 051 20561	560R 5% 0,1W
3563	4822 117 11454	820R 1% 0,1W
3564	4822 051 20122	1k2 5% 0,1W
3565	4822 117 11449	2k2 1% 0,1W
3566	4822 051 20472	4k7 5% 0,1W
3571	4822 116 52276	3k9 5% 0,5W
3572	4822 051 20561	560R 5% 0,1W
3573	4822 117 11454	820R 1% 0,1W

3574	4822 051 20122	1k2 5% 0,1W
3575	4822 116 52256	2k2 5% 0,5W
3578	4822 117 11504	270R 1% 0.1W
3579	4822 117 11504	270R 1% 0.1W
3581	4822 051 20392	3k9 5% 0,1W
3582	4822 051 20561	560R 5% 0,1W
3583	4822 117 11454	820R 1% 0,1W
3584	4822 116 52207	1k2 5% 0,5W
3585	4822 117 11449	2k2 1% 0,1W
3586	4822 051 20472	4k7 5% 0,1W
3590	4822 051 20472	4k7 5% 0,1W
3591	4822 051 20392	3k9 5% 0,1W
3592	4822 116 52226	560R 5% 0,5W
3593	4822 117 11454	820R 1% 0,1W
3594	4822 051 20122	1k2 5% 0,1W
3595	4822 117 11449	2k2 1% 0,1W
3596	4822 051 20472	4k7 5% 0,1W
3597	4822 117 10833	10k 1% 0,1W
3598	4822 117 10833	10k 1% 0,1W
3599	4822 117 10833	10k 1% 0,1W
3600	4822 117 11503	220R 1% 0.1W
3601	4822 116 83884	47k 5% 0,5W
3603	4822 050 11002	1k 1% 0,4W
3604	4822 051 20684	680k 5% 0,1W
3605	4822 051 20105	1M 5% 0,1W
3606	4822 051 10102	1k 2% 0,25W
3607	4822 051 20105	1M 5% 0,1W
3608	4822 051 10102	1k 2% 0,25W
3609	4822 051 10102	1k 2% 0,25W
3611	4822 051 10102	1k 2% 0,25W
3612	4822 051 10102	1k 2% 0,25W
3613	4822 051 10102	1k 2% 0,25W
3615	4822 117 10834	47k 1% 0,1W
3616	4822 117 10834	47k 1% 0,1W
3617	4822 050 11002	1k 1% 0,4W
3618	4822 051 10102	1k 2% 0,25W
3619	4822 051 10102	1k 2% 0,25W
3621	4822 051 10102	1k 2% 0,25W
3622	4822 051 10102	1k 2% 0,25W
3623	4822 051 10102	1k 2% 0,25W
3624	4822 051 10102	1k 2% 0,25W
3625	4822 051 10102	1k 2% 0,25W
3627	4822 051 10102	1k 2% 0,25W
3628	4822 051 10102	1k 2% 0,25W
3629	4822 051 10102	1k 2% 0,25W
3630	4822 051 10102	1k 2% 0,25W
3631	4822 051 10102	1k 2% 0,25W
3632	4822 051 10102	1k 2% 0,25W
3633	4822 051 10102	1k 2% 0,25W
3634	4822 051 10102	1k 2% 0,25W
3635	4822 051 10102	1k 2% 0,25W
3636	4822 117 10833	10k 1% 0,1W

ELECTRICAL PARTS LIST - FRONT BOARD

3637	4822 117 10833	10k 1% 0,1W
3638	4822 117 10833	10k 1% 0,1W
3639	4822 117 10833	10k 1% 0,1W
3640	4822 051 10102	1k 2% 0,25W
3643	4822 117 10833	10k 1% 0,1W
3644	4822 117 10833	10k 1% 0,1W
3645	4822 117 10833	10k 1% 0,1W
3646	4822 117 10833	10k 1% 0,1W
3647	4822 117 11449	2k2 1% 0,1W
3651	4822 051 20224	220k 5% 0,1W
3655	4822 117 10834	47k 1% 0,1W
3658	4822 051 20332	3k3 5% 0,1W
3659	4822 117 10834	47k 1% 0,1W
3660	4822 051 20332	3k3 5% 0,1W
3661	4822 117 10834	47k 1% 0,1W
3662	4822 051 20332	3k3 5% 0,1W
3664	4822 051 10102	1k 2% 0,25W
3665	4822 051 10102	1k 2% 0,25W
3666	4822 051 10102	1k 2% 0,25W
3667	4822 051 20471	470R 5% 0,1W
3668	4822 051 10102	1k 2% 0,25W
3669	4822 051 10102	1k 2% 0,25W
3670	4822 051 10102	1k 2% 0,25W
3671	4822 051 10102	1k 2% 0,25W
3672	4822 051 10102	1k 2% 0,25W
3673	4822 051 10102	1k 2% 0,25W
3674	4822 050 11002	1k 1% 0,4W
3675	4822 050 11002	1k 1% 0,4W
3676	4822 050 11002	1k 1% 0,4W
3677	4822 116 52175	100R 5% 0,5W
3678	4822 116 52175	100R 5% 0,5W
3679	4822 051 20273	27k 5% 0,1W
3680	4822 051 20822	8k2 5% 0,1W
3681	4822 117 10834	47k 1% 0,1W
3682	4822 117 10834	47k 1% 0,1W
3686	4822 117 10834	47k 1% 0,1W
3687	4822 051 20472	4k7 5% 0,1W
3688	4822 051 20223	22k 5% 0,1W
3690	4822 117 10833	10k 1% 0,1W
3692	4822 117 10833	10k 1% 0,1W
3705	4822 117 11149	82k 1% 0,1W
3706	4822 116 52175	100R 5% 0,5W
3707	4822 117 11149	82k 1% 0,1W
3708	4822 116 52175	100R 5% 0,5W
3709	4822 117 11149	82k 1% 0,1W
3710	4822 116 52175	100R 5% 0,5W
3711	4822 117 11149	82k 1% 0,1W
3712	4822 116 52175	100R 5% 0,5W
3713	4822 117 11149	82k 1% 0,1W
3714	4822 116 52175	100R 5% 0,5W
3715	4822 117 11149	82k 1% 0,1W
3716	4822 116 52175	100R 5% 0,5W

4401	4822 051 20008	0R Jumper 0805
4402	4822 051 20008	0R Jumper 0805
4403	4822 051 20008	0R Jumper 0805
4406	4822 051 20008	0R Jumper 0805
4407	4822 051 20008	0R Jumper 0805
4408	4822 051 20008	0R Jumper 0805
4409	4822 051 20008	0R Jumper 0805
4410	4822 051 20008	0R Jumper 0805
4411	4822 051 20008	0R Jumper 0805
4412	4822 051 20008	0R Jumper 0805
4413	4822 051 20008	0R Jumper 0805
4414	4822 051 20008	0R Jumper 0805
4415	4822 051 20008	0R Jumper 0805
4416	4822 051 20008	0R Jumper 0805
4417	4822 051 20008	0R Jumper 0805
4418	4822 051 20008	0R Jumper 0805
4419	4822 051 20008	0R Jumper 0805
4423	4822 051 20008	0R Jumper 0805
4424	4822 051 20008	0R Jumper 0805
4425	4822 051 20008	0R Jumper 0805
4427	4822 051 20008	0R Jumper 0805
4428	4822 051 20008	0R Jumper 0805
4431	4822 051 20008	0R Jumper 0805
4432	4822 051 20008	0R Jumper 0805
4433	4822 051 20008	0R Jumper 0805
4434	4822 051 20008	0R Jumper 0805
4435	4822 051 20008	0R Jumper 0805
4436	4822 051 20008	0R Jumper 0805
4437	4822 051 20008	0R Jumper 0805
4438	4822 051 20008	0R Jumper 0805
4441	4822 051 20008	0R Jumper 0805
4442	4822 051 20008	0R Jumper 0805
4443	4822 051 20008	0R Jumper 0805
4444	4822 051 20008	0R Jumper 0805
4445	4822 051 20008	0R Jumper 0805
4450	4822 051 20008	0R Jumper 0805
4451	4822 051 20008	0R Jumper 0805
4452	4822 051 20008	0R Jumper 0805
4453	4822 051 20008	0R Jumper 0805
4454	4822 051 20008	0R Jumper 0805
4455	4822 051 20008	0R Jumper 0805
4456	4822 051 20008	0R Jumper 0805
4471	4822 051 20008	0R Jumper 0805
4472	4822 051 20008	0R Jumper 0805
4473	4822 051 20008	0R Jumper 0805
4501	4822 051 20008	0R Jumper 0805
4502	4822 051 20008	0R Jumper 0805
4504	4822 051 20008	0R Jumper 0805
4505	4822 051 20008	0R Jumper 0805
4506	4822 051 20008	0R Jumper 0805
4507	4822 051 20008	0R Jumper 0805
4508	4822 051 20008	0R Jumper 0805

ELECTRICAL PARTS LIST - FRONT BOARD

RESISTORS

4509	4822 051 20008	0R Jumper 0805
4510	4822 051 20008	0R Jumper 0805
4511	4822 051 20008	0R Jumper 0805
4512	4822 051 20008	0R Jumper 0805
4513	4822 051 20008	0R Jumper 0805
4515	4822 051 20008	0R Jumper 0805
4516	4822 051 20008	0R Jumper 0805
4517	4822 051 20008	0R Jumper 0805
4518	4822 051 20008	0R Jumper 0805
4521	4822 051 20008	0R Jumper 0805
4522	4822 051 20008	0R Jumper 0805
4523	4822 051 20008	0R Jumper 0805
4524	4822 051 20008	0R Jumper 0805
4526	4822 051 20008	0R Jumper 0805
4527	4822 051 20008	0R Jumper 0805
4528	4822 051 20008	0R Jumper 0805
4532	4822 051 20008	0R Jumper 0805
4533	4822 051 20008	0R Jumper 0805
4535	4822 051 20008	0R Jumper 0805
4536	4822 051 20008	0R Jumper 0805
4537	4822 051 20008	0R Jumper 0805
4540	4822 051 20008	0R Jumper 0805
4541	4822 051 20008	0R Jumper 0805
4542	4822 051 20008	0R Jumper 0805
4543	4822 051 20008	0R Jumper 0805

COILS & FILTERS

5401	4822 156 21721	Fixed Inductor 2μ2 10%
5402	4822 156 21721	Fixed Inductor 2μ2 10%
5403	4822 156 21721	Fixed Inductor 2μ2 10%
5404	4822 156 21721	Fixed Inductor 2μ2 10%
5405	4822 156 21721	Fixed Inductor 2μ2 10%
5406	4822 156 21721	Fixed Inductor 2μ2 10%
5462	4822 156 21721	Fixed Inductor 2μ2 10%
5463	4822 156 21721	Fixed Inductor 2μ2 10%
5464	4822 156 21721	Fixed Inductor 2μ2 10%

DIODES

6401	4822 130 31878	1N4003G
6402	4822 130 31878	1N4003G
6403	4822 130 31878	1N4003G
6404	4822 130 31878	1N4003G
6411	4822 130 10791	LTL-1CHGE
6412	4822 130 10791	LTL-1CHGE
6413	4822 130 10791	LTL-1CHGE
6414	4822 130 10791	LTL-1CHGE
6415	4822 130 10791	LTL-1CHGE
6416	4822 130 10791	LTL-1CHGE
6417	4822 130 10791	LTL-1CHGE
6418	4822 130 10791	LTL-1CHGE
6420	4822 130 10791	LTL-1CHGE
6421	4822 130 10791	LTL-1CHGE
6422	4822 130 10791	LTL-1CHGE
6423	4822 130 10791	LTL-1CHGE
6424	4822 130 10791	LTL-1CHGE
6425	4822 130 10791	LTL-1CHGE
6431	4822 130 10791	LTL-1CHGE
6432	4822 130 10791	LTL-1CHGE
6433	4822 130 10791	LTL-1CHGE
6434	4822 130 10791	LTL-1CHGE
6435	4822 130 10791	LTL-1CHGE
6436	4822 130 10774	LTL-293SJ
6437	4822 130 10774	LTL-293SJ
6438	4822 130 10774	LTL-293SJ
6439	4822 130 10774	LTL-293SJ
6451	4822 130 10774	LTL-293SJ
6452	4822 130 10774	LTL-293SJ
6453	4822 130 10774	LTL-293SJ
6461	4822 130 31878	1N4003G
6462	4822 130 31878	1N4003G
6463	4822 130 31878	1N4003G

TRANSISTORS & INTEGRATED CIRCUITS

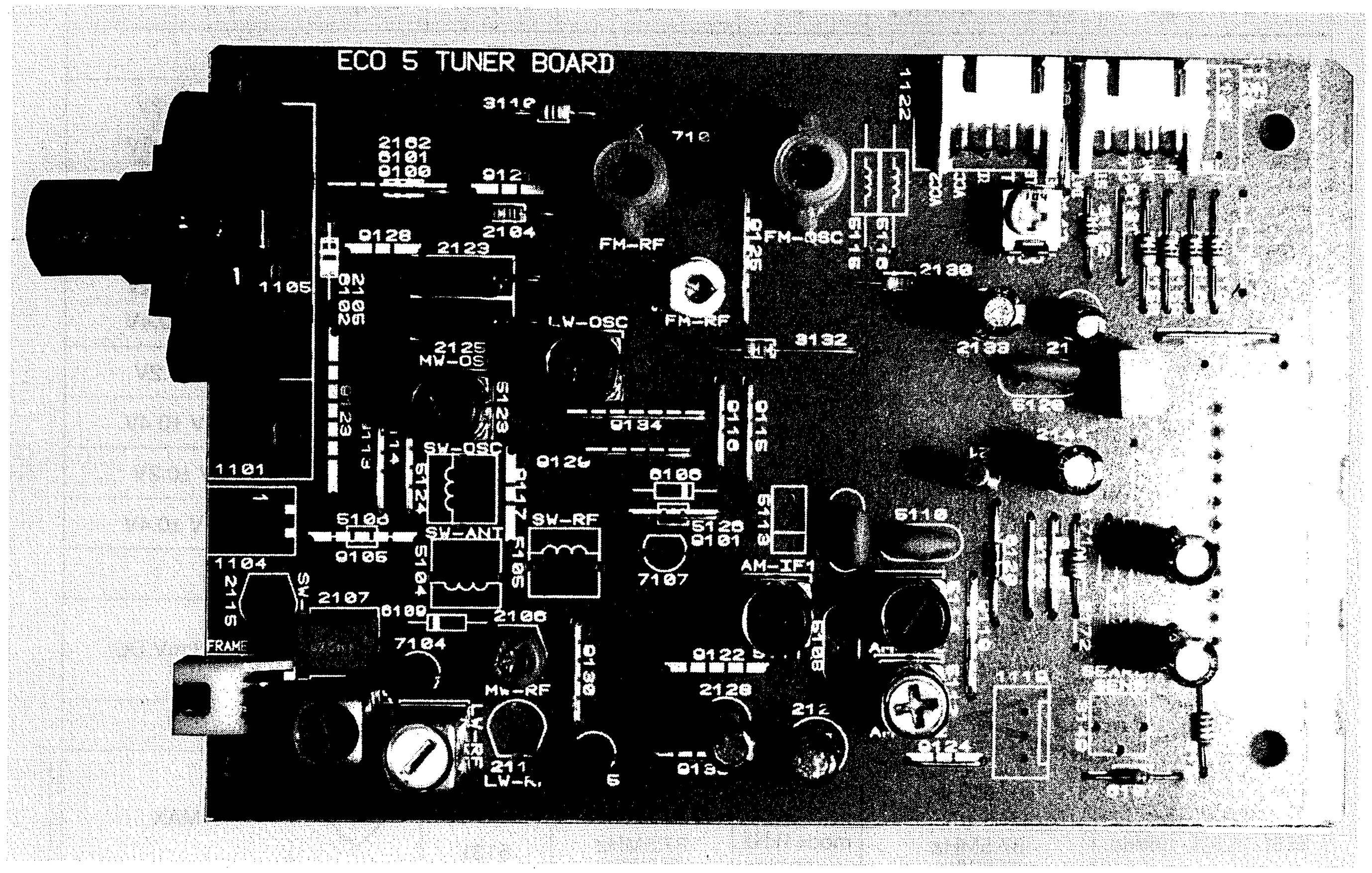
7401	4822 209 16161	TMP87CP74F - "860FS36701" (or OTP Ver. 23)
7402	4822 209 15449	74HC4094D
7403	4822 209 15449	74HC4094D
7405	4822 130 10165	GP1U28XP
7406	4822 130 60511	BC847B
7411	4822 130 60511	BC847B
7412	5322 130 60508	BC857B
7413	4822 130 60511	BC847B
7414	4822 130 60511	BC847B
7415	4822 130 60511	BC847B
7420	5322 130 60508	BC857B
7421	4822 130 60511	BC847B
7422	5322 130 60508	BC857B
7423	4822 130 60511	BC847B
7424	5322 130 60508	BC857B
7425	4822 130 60511	BC847B
7426	5322 130 60508	BC857B
7427	4822 130 60511	BC847B
7429	4822 130 60511	BC847B
7431	4822 130 60511	BC847B
7433	4822 130 60511	BC847B
7434	4822 130 60511	BC847B
7435	4822 130 60511	BC847B
7436	4822 130 60511	BC847B
7437	4822 130 60511	BC847B
7438	4822 130 60511	BC847B
7440	4822 130 60511	BC847B
7441	5322 130 60508	BC857B
7442	4822 130 60511	BC847B
7443	4822 130 60511	BC847B

ELECTRICAL PARTS LIST - FRONT BOARD

TRANSISTORS & INTEGRATED CIRCUITS

7444	5322 130 60508	BC857B
7445	4822 130 60511	BC847B
7446	4822 130 60511	BC847B
7447	5322 130 60508	BC857B
7448	4822 130 60511	BC847B
7461	4822 209 16162	TMP87CS71F - OTP Ver. 24
7462	4822 209 31508	ST24C01B1
7463	4822 209 31981	SAA6579T

Note: Only the parts mentioned in this list are normal service spare parts.


ECO 5 TUNER BOARD
FM-RF
FM-OSC
LW-OSC
MW-OSC
SW-OSC
SW-RF
SW-ANT
AM-IF1
MW-RF
LW-RF
1101
1104
1105
1122
FRAME

TUNER BOARD ECO5

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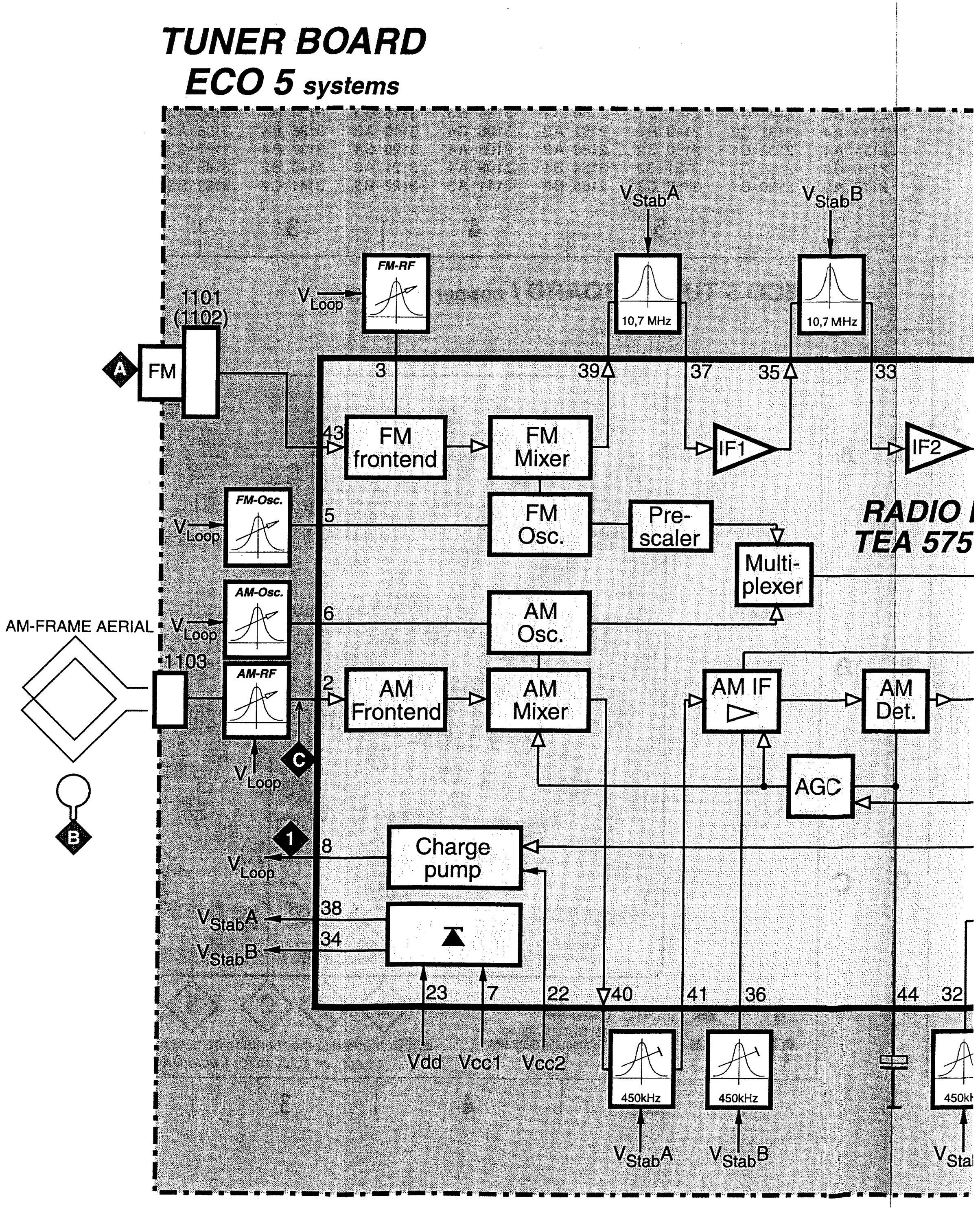
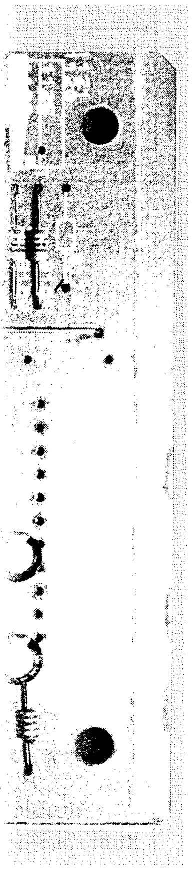
Blockdiagram 7B-1
Adjustmant table 7B-2
Component layout...7B-2
Circuit diagram...7B-3
Partslist 7B-4

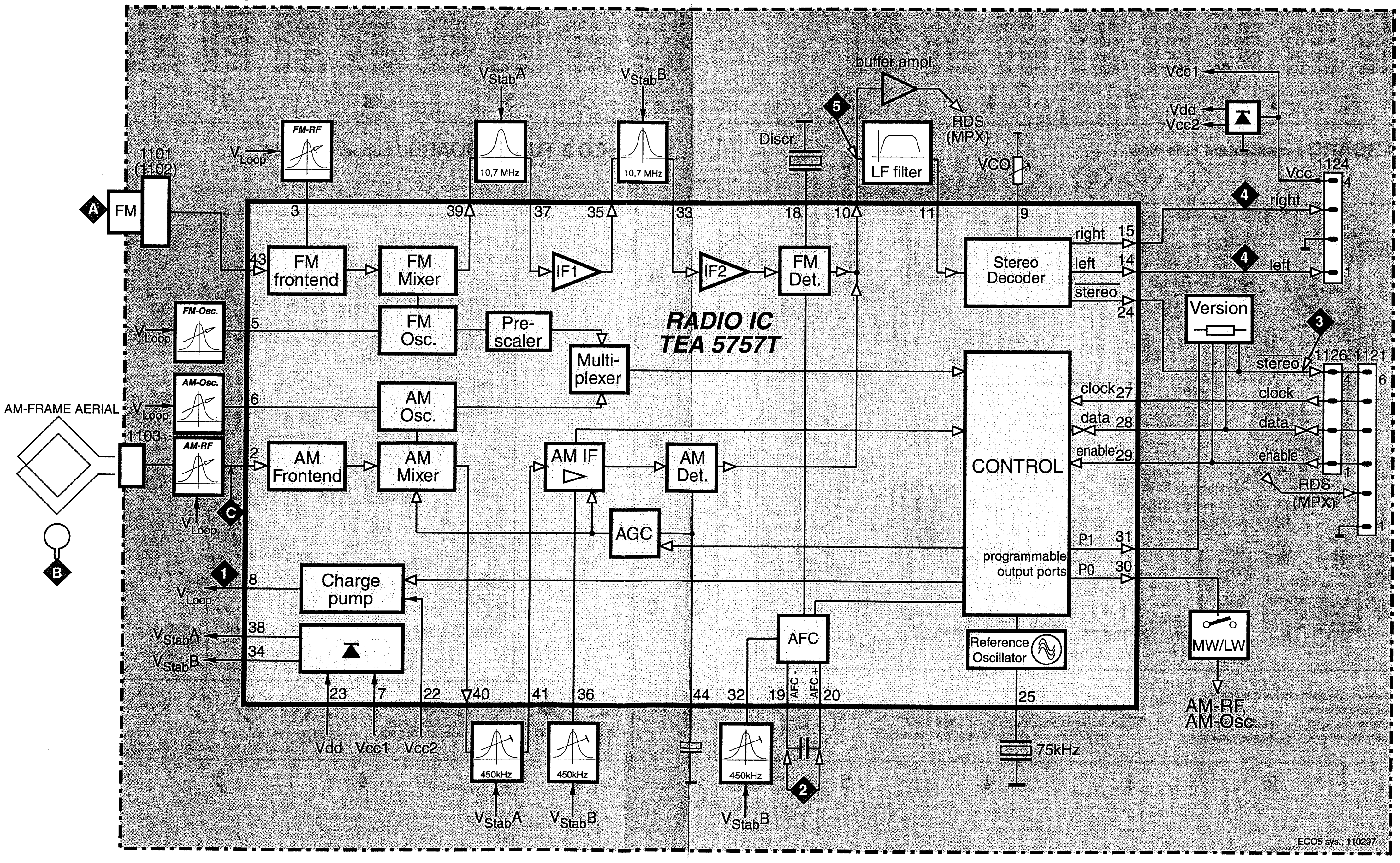
BLOCKDIAGRAM


TUNER BOARD
ECO 5 systems
VStabA
VStabB
FM-RF
VLoop
10,7 MHz
10,7 MHz
1101
(1102)
A
FM
3
39
37
35
33
43
FM frontend
FM Mixer
IF1
IF2
RADIO
TEA 575
FM-Osc.
5
FM Osc.
Pre-scaler
Multi-plexer
AM-Osc.
AM-FRAME AERIAL
6
AM Osc.
1103
AM-RF
2
AM Frontend
AM Mixer
AM IF
AM Det.
C
AGC
B
1
8
Charge pump
38
34
23
7
22
40
41
36
44
32
Vdd
Vcc1
Vcc2
450kHz
450kHz
450kH

BLOCKDIAGRAM

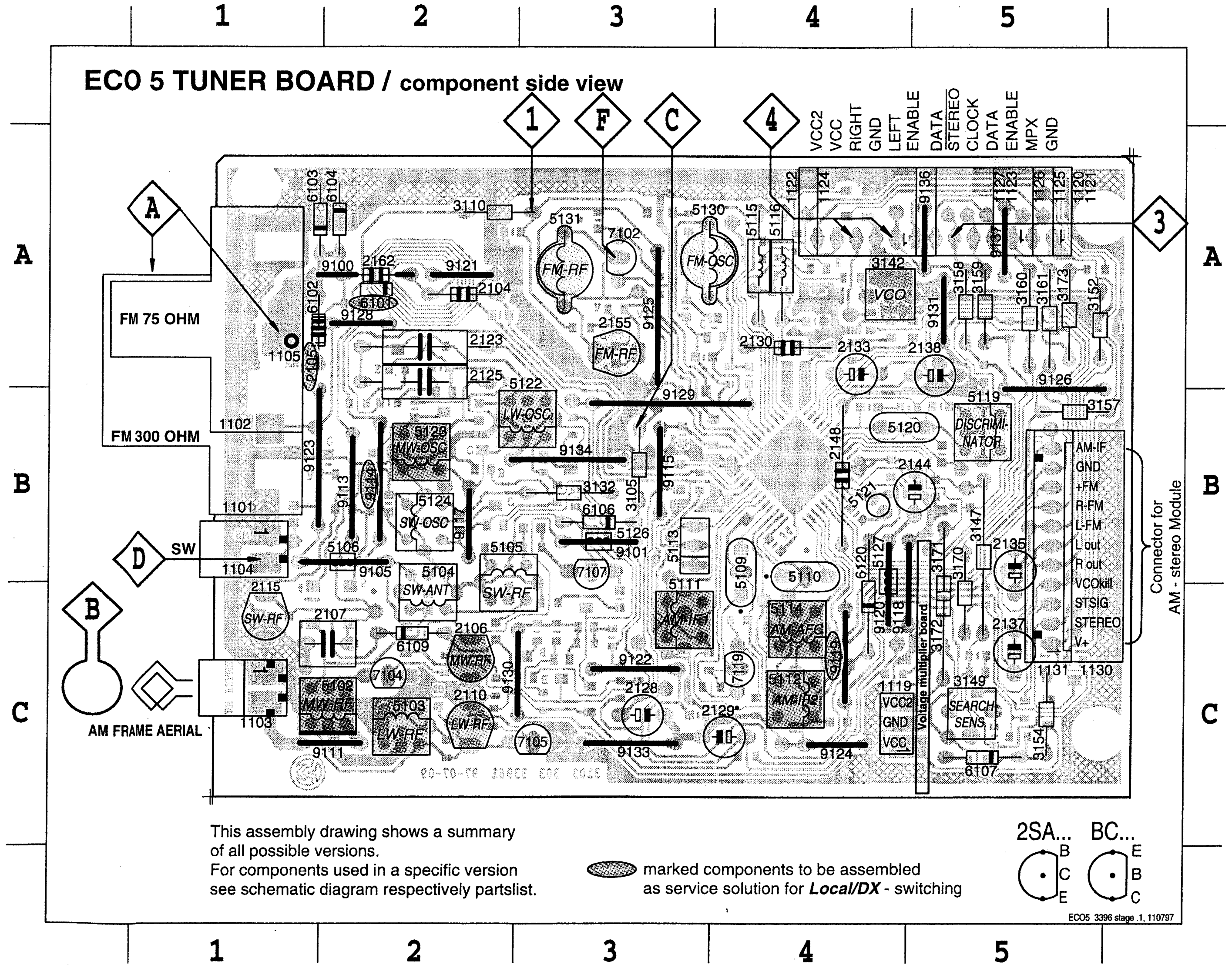


TUNER BOARD
ECO 5 systems



RADIO IC
TEA 5757T
FM
1101
(1102)
A
FM-RF
VLoop
FM frontend
FM Mixer
FM Osc.
Pre-scaler
Multi-plexer
FM-Osc.
AM-Osc.
AM-RF
AM-FRAME AERIAL
1103
B
C
AM Osc.
AM Frontend
AM Mixer
AM IF
AM Det.
AGC
IF1
IF2
FM Det.
VStabA
VStabB
10,7 MHz
10,7 MHz
Discr.
buffer ampl.
RDS (MPX)
LF filter
VCO
Stereo Decoder
CONTROL
programmable output ports
P1
P0
Charge pump
AFC
AFC -
AFC +
Reference Oscillator
75kHz
450kHz
450kHz
450kHz
Vdd
Vcc1
Vcc2
Version
MW/LW
AM-RF, AM-Osc.
Vcc1
Vdd
Vcc2
Vcc
1124
1126
1121
right
left
stereo
clock
data
enable
RDS (MPX)
1
2
3
4
5
3
43
5
6
2
8
38
34
23
7
22
40
41
36
44
32
19
20
25
39
37
35
33
18
10
11
9
15
14
24
27
28
29
31
30
ECO5 sys., 110297

1101	A1	2106	C2	2137	C5	3149	C5	3173	A5	5114	C4	5130	A3	7104	C2	9117	B2	9129	B3
1102	A1	2107	C2	2138	A5	3152	A5	5102	C2	5115	A4	5131	A3	7105	C3	9118	B4	9130	C3
1103	C1	2110	C2	2144	B5	3154	C5	5103	C2	5116	A4	6101	A2	7107	B3	9119	C4	9131	A5
1104	B1	2115	C1	2148	B4	3157	B5	5104	C2	5119	B5	6102	A1	7119	C4	9120	B4	9133	C3
1105	A1	2123	A2	2155	A3	3158	A5	5105	B2	5120	B4	6103	A1	9100	A2	9121	A2	9134	B3
1119	C5	2125	A2	2162	A2	3159	A5	5106	B2	5121	B4	6104	A2	9101	B3	9122	C3	9136	A5
1120	A5	2128	C3	3105	B3	3160	A5	5109	B4	5122	B3	6106	B3	9105	B2	9123	B1	9137	A5
1130	B5	2129	C4	3110	A2	3161	A5	5110	B4	5123	B2	6107	C5	9111	C2	9124	C4		
1131	B5	2130	A4	3132	B3	3170	C5	5111	C3	5124	B2	6109	C2	9113	B2	9125	A3		
2104	A2	2133	A4	3142	A4	3171	C5	5112	C4	5126	B3	6120	C4	9114	B2	9126	B5		
2105	A1	2135	B5	3147	B5	3172	C5	5113	B3	5127	B4	7102	A3	9115	B3	9128	A2		


1
2
3
4
5
A
B
C
1
F
C
4
VCC2
VCC
RIGHT
GND
LEFT
ENABLE
DATA
STEREO
CLOCK
DATA
ENABLE
MPX
GND
3
A
D
B
FM 75 OHM
FM 300 OHM
SW
AM FRAME AERIAL
FM-RF
FM-OSC
VCO
LW-OSC
MW-OSC
SW-OSC
SW-ANT
SW-RF
MW-RF
LW-RF
AM-IF1
AM-AFC
DISCRIMI-NATOR
SEARCH SENS
Voltage multiplier board
AM-IF
GND
+FM
R-FM
L-FM
L out
R out
VCOkill
STSIG
STEREO
V+
Connector for AM - stereo Module
2SA...
BC...
B
C
E
E
B
C

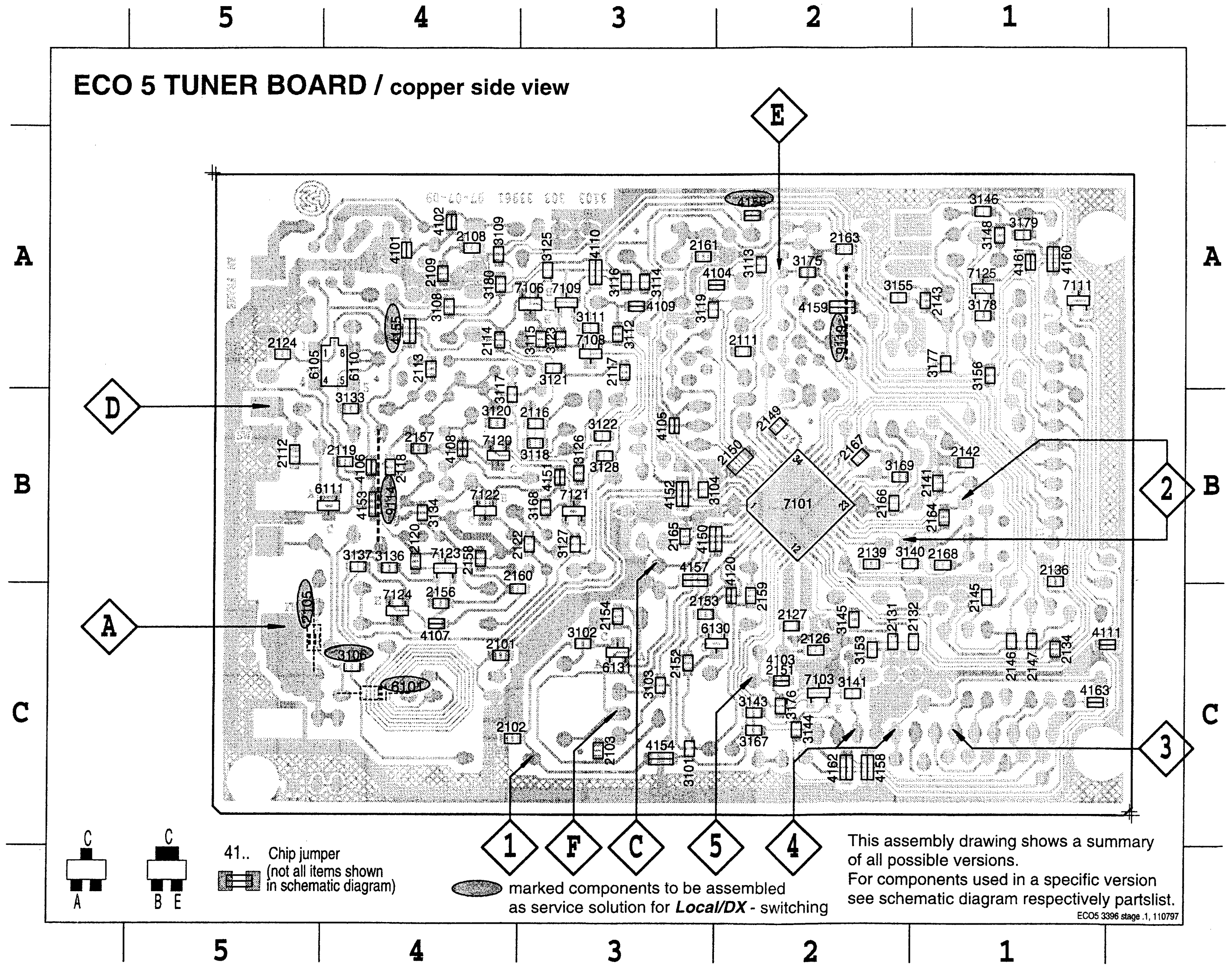
ECO 5 TUNER BOARD / component side view

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

▨ marked components to be assembled as service solution for *Local/DX* - switching

ECO5 3396 stage .1, 110797

2101	C4	2118	B4	2139	B2	2153	C3	2166	B2	3112	A3	3123	A3	3143	C2	3175	A2	4106	B4	4154	C3	6110	A4	7121	B3
2102	C4	2119	B4	2141	B1	2154	C3	2167	B2	3113	A2	3125	A3	3144	C2	3176	C2	4107	C4	4155	A4	6111	B4	7122	B4
2103	C3	2120	B4	2142	B1	2156	C4	2168	B1	3114	A3	3126	B3	3145	C2	3177	A1	4108	B4	4156	A2	6130	C2	7123	B4
2108	A4	2122	B3	2143	A1	2157	B4	3101	C3	3115	A3	3127	B3	3146	A1	3178	A1	4109	A3	4157	B3	6131	C3	7124	C4
2109	A4	2124	A5	2145	C1	2158	B4	3102	C3	3116	A3	3128	B3	3148	A1	3179	A1	4110	A3	4158	C2	7101	B2	7125	A1
2111	A2	2126	C2	2146	C1	2159	C2	3103	C3	3117	B4	3133	B4	3153	C2	3180	A4	4111	C1	4159	A2	7103	C2		
2112	B5	2127	C2	2147	C1	2160	C4	3104	B3	3118	B3	3134	B4	3155	A2	4101	A4	4120	C2	4160	A1	7106	A3		
2113	A4	2131	C2	2149	B2	2161	A3	3106	C4	3119	A3	3136	B4	3156	A1	4102	A4	4150	B2	4161	A1	7108	A3		
2114	A4	2132	C1	2150	B2	2163	A2	3108	A4	3120	B4	3137	B4	3167	C2	4103	C2	4151	B3	4162	C1	7109	A3		
2116	B3	2134	C1	2151	C2	2164	B1	3109	A4	3121	A3	3140	B2	3168	B3	4104	A2	4152	B3	4163	C1	7111	A1		
2117	A3	2136	B1	2152	C3	2165	B3	3111	A3	3122	B3	3141	C2	3169	B2	4105	B3	4153	B4	6105	A4	7120	B4		


5
4
3
2
1
A
B
C
E
D
A
2
3
1
F
C
5
4
7101
C
A
C
B E
41..
Chip jumper
(not all items shown in schematic diagram)

ECO 5 TUNER BOARD / copper side view

▨ marked components to be assembled as service solution for *Local/DX* - switching

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

ECO5 3396 stage .1, 110797

TUNER ADJ

Waverange
VARICAP ALIG
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108
MW FM/AM-version, 10kHz g 530 - 1700kHz
FM/MW-version, 9kHz gr 531 - 1602kHz
LW 153 - 279kHz
MW FM/MW/LW- version, 9k 531 - 1602kHz
FM IF
FM
FM RF
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108
VCO
FM
AM IF
MW
AM AFC **MW**
AM RF 3)
MW 4) FM/MW/LW- and FM/MW-ve (9kHz grid) 531 - 1602kHz
LW
MW FM/AM-version, 10kHz g 530 - 1700kHz

Use service test progr

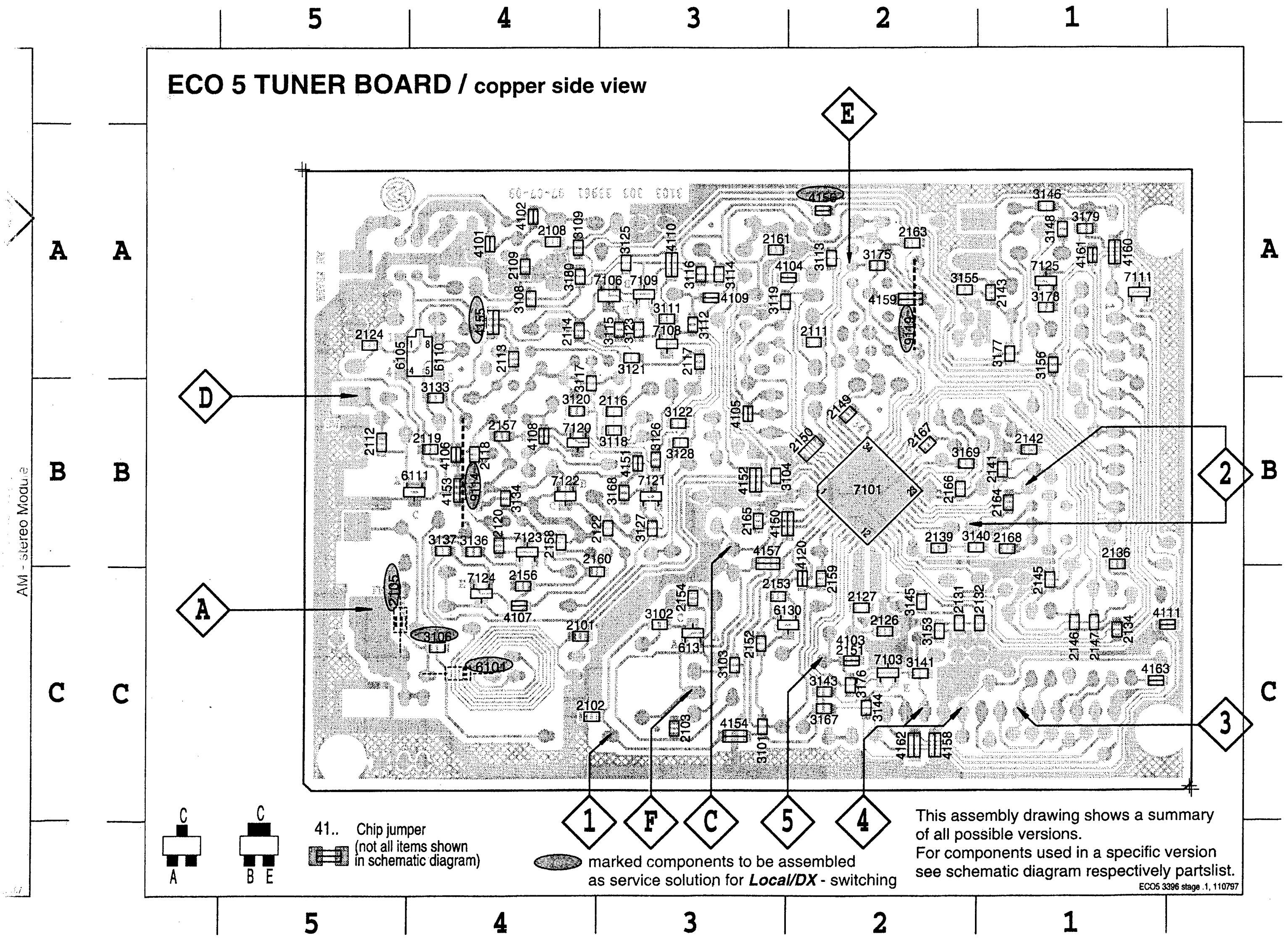
1) If sensitivity of freque
(input signal: stereo

3) For AM RF adjustme

↕ Repeat

2101 C4	2118 B4	2139 B2	2153 C3	2166 B2	3112 A3	3123 A3	3143 C2	3175 A2	4106 B4	4154 C3	6110 A4	7121 B3
2102 C4	2119 B4	2141 B1	2154 C3	2167 B2	3113 A2	3125 A3	3144 C2	3176 C2	4107 C4	4155 A4	6111 B4	7122 B4
2103 C3	2120 B4	2142 B1	2156 C4	2168 B1	3114 A3	3126 B3	3145 C2	3177 A1	4108 B4	4156 A2	6130 C2	7123 B4
2108 A4	2122 B3	2143 A1	2157 B4	3101 C3	3115 A3	3127 B3	3146 A1	3178 A1	4109 A3	4157 B3	6131 C3	7124 C4
2109 A4	2124 A5	2145 C1	2158 B4	3102 C3	3116 A3	3128 B3	3148 A1	3179 A1	4110 A3	4158 C2	7101 B2	7125 A1
2111 A2	2126 C2	2146 C1	2159 C2	3103 C3	3117 B4	3133 B4	3153 C2	3180 A4	4111 C1	4159 A2	7103 C2	
2112 B5	2127 C2	2147 C1	2160 C4	3104 B3	3118 B3	3134 B4	3155 A2	4101 A4	4120 C2	4160 A1	7106 A3	
2113 A4	2131 C2	2149 B2	2161 A3	3106 C4	3119 A3	3136 B4	3156 A1	4102 A4	4150 B2	4161 A1	7108 A3	
2114 A4	2132 C1	2150 B2	2163 A2	3108 A4	3120 B4	3137 B4	3167 C2	4103 C2	4151 B3	4162 C1	7109 A3	
2116 B3	2134 C1	2151 C2	2164 B1	3109 A4	3121 A3	3140 B2	3168 B3	4104 A2	4152 B3	4163 C1	7111 A1	
2117 A3	2136 B1	2152 C3	2165 B3	3111 A3	3122 B3	3141 C2	3169 B2	4105 B3	4153 B4	6105 A4	7120 B4	

ECO 5 TUNER BOARD / copper side view

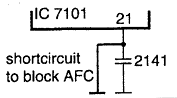
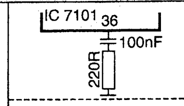
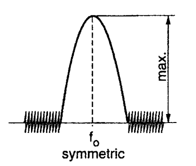
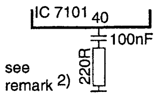
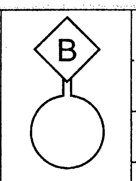
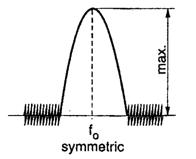


marked components to be assembled as service solution for ***Local/DX*** - switching

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

ECO5 3396 stage .1, 110797

TUNER ADJUSTMENT TABLE (**ECO5** FM/MW- and FM/MW/LW - versions with AM-frame aerial)

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130	◇1	8V ±0.2V
			87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)
MW FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123		8V ±0.2V
			530kHz	check		1.1V ±0.4V
FM/MW-version, 9kHz grid 531 - 1602kHz			1602kHz	5123		6.9V ±0.2V
			531kHz	check		1.1V ±0.4V
LW 153 - 279kHz			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
MW FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123		8V ±0.2V
			531kHz	check		1.1V ±0.4V
FM IF						
FM	10.7MHz, 50mV continuous wave	◇F	 IC 7101 21 shortcircuit to block AFC 2141	5119	◇2	0 ± 3 mV DC
FM RF						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz	◇A	108MHz	2155	◇4	MAX
	87.5MHz (65.81MHz)	mod=1kHz Δf=±22.5kHz	87.5MHz (65.81MHz)	5131		
VCO						
FM	98MHz, 1mV continuous wave	◇A	98MHz	3142	◇3	152kHz ±1kHz [1]
AM IF						
MW	450kHz connect pin 6 of IC 7101 (AM Osc.) with short wire to ground (pin 4)	◇C Δf=±15kHz V_{RF} = 3mV	 IC 7101 36 100nF 220R	5111	◇4	 max. f_o symmetric
			 IC 7101 40 100nF 220R see remark 2)	5112		
AM AFC **MW**		◇C continuous wave V_{RF} = 10mV		5114	◇2	0 ± 2 mV DC
AM RF [3]						
MW [4] FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	1494kHz	 ◇B Δf = ±30kHz V_{RF} as low as possible	1494kHz	2106	◇4	 max. f_o symmetric
	558kHz		558kHz	5102		
LW	198kHz		198kHz	5103		
MW FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz		1500kHz	2106		
	560kHz		560kHz	5102		

ECO5, discr. coil, 090797

Use service test program. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

---

[1] If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)

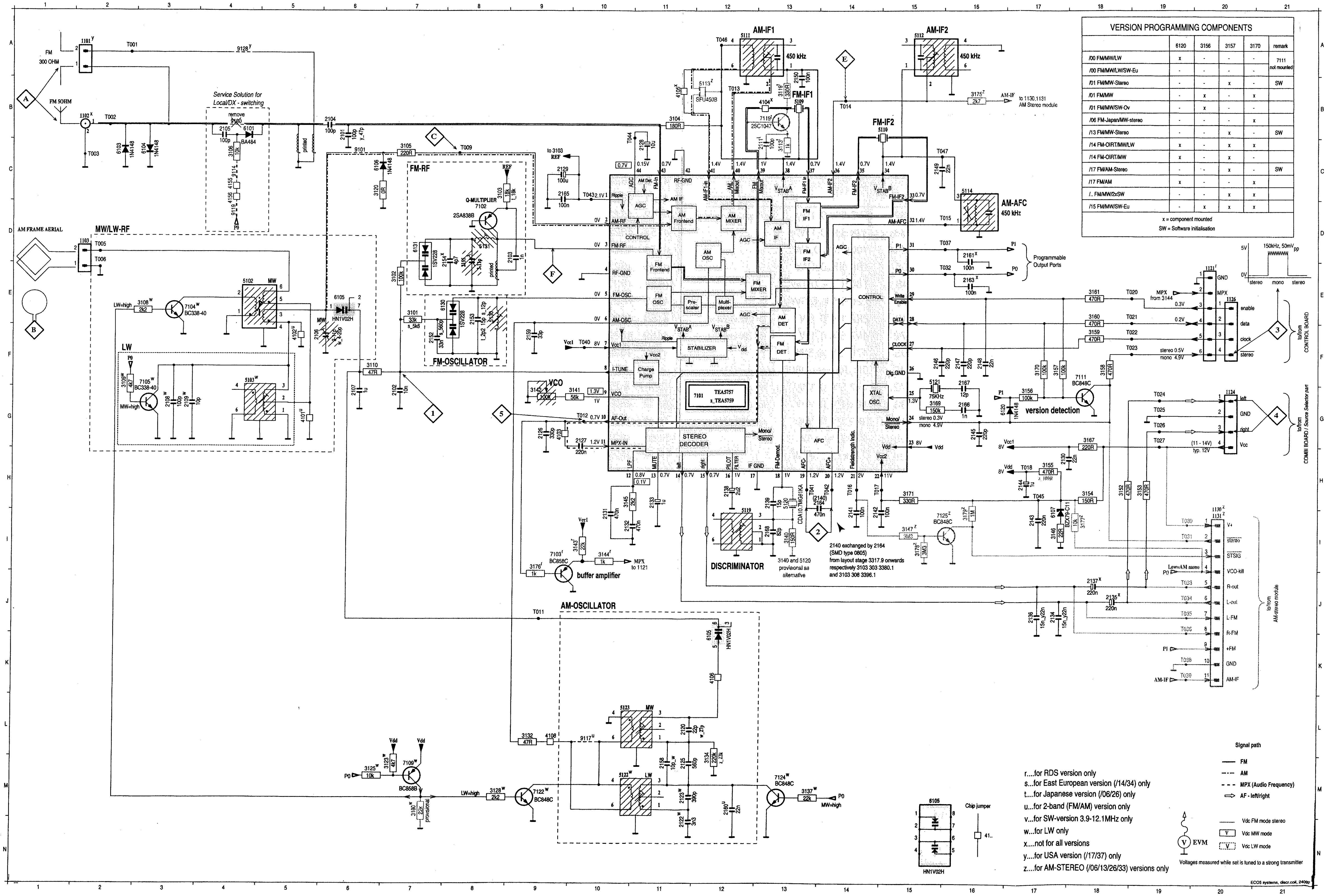
[2] RC network serves for damping the IF-filter while adjusting the other one.

[3] For AM RF adjustments the original frame antenna has to be used !

[4] MW has to be aligned before LW.

↕ Repeat

TUNER BOARD ECO5 / Systems


FM 300 OHM
FM 50HM
AM FRAME AERIAL
MW/LW-RF
LW
Service Solution for Local/DX - switching
remove
FM-RF
Q-MULTIPLIER 7102
2SA838B
FM-OSCILLATOR
AM-IF1
AM-IF2
FM-IF1
FM-IF2
AM-AFC 450 kHz
450 kHz
2SC1047
TEA5757 / TEA5759
7101
AGC
AM Frontend
AM MIXER
AM OSC
AM IF
FM IF1
FM IF2
FM Frontend
FM OSC
Pre-scaler
Multi-plexer
FM MIXER
AM DET
FM DET
STABILIZER
Charge Pump
CONTROL
XTAL OSC.
STEREO DECODER
AFC
VCO
Programmable Output Ports
version detection
buffer amplifier
DISCRIMINATOR
2140 exchanged by 2164 (SMD type 0805) from layout stage 3317.9 onwards respectively 3103 303 3380.1 and 3103 308 3396.1
3140 and 5120 provisional as alternative
AM-OSCILLATOR
to/from CONTROL BOARD
to/from COMBI BOARD / Source Selector part
to/from AM-stereo module
to 1130,1131 AM Stereo module
150kHz, 50mVpp
5V
0V
stereo
mono
GND
MPX
enable
data
clock
stereo
left
right
Vcc
V+
STSIG
VCO-kill
R-out
L-out
L-FM
R-FM
+FM
AM-IF
Chip jumper
HN1V02H
ECO5 systems, discr.coil, 240997

VERSION PROGRAMMING COMPONENTS					
	6120	3156	3157	3170	remark
/00 FM/MW/LW	x	-	-	-	7111 not mounted
/00 FM/MW/LW/SW-Eu	-	-	-	-	
/01 FM/MW-Stereo	-	-	x	-	SW
/01 FM/MW	-	x	-	x	
/01 FM/MW/SW-Ov	-	x	-	-	
/06 FM-Japan/MW-stereo	-	-	-	x	
/13 FM/MW-Stereo	-	-	x	-	SW
/14 FM-OIRT/MW/LW	x	-	x	x	
/14 FM-OIRT/MW	x	-	x	-	
/17 FM/AM-Stereo	-	-	x	-	SW
/17 FM/AM	x	-	-	x	
/.. FM/MW/2xSW	-	-	x	x	
/15 FM/MW/SW-Eu	-	x	x	x	

x = component mounted
SW = Software initialisation

r....for RDS version only
s...for East European version (/14/34) only
t....for Japanese version (/06/26) only
u...for 2-band (FM/AM) version only
v...for SW-version 3.9-12.1MHz only
w...for LW only
x....not for all versions
y....for USA version (/17/37) only
z....for AM-STEREO (/06/13/26/33) versions only

Signal path
- —— FM
- –·– AM
- - - - MPX (Audio Frequency)
- ⇨ AF - left/right

EVM
- .... Vdc FM mode stereo
- V Vdc MW mode
- V Vdc LW mode

Voltages measured while set is tuned to a strong transmitter

1101	A 1
1102	B 2
1103	D 2
1121	E20
1124	G20
1126	E20
1130	I20
1131	I20
2101	C 6
2102	G 7
2103	D 9
2104	B 6
2106	F 5
2107	G 6
2108	G 3
2109	G 3
2111	C13
2120	L11
2122	N11
2123	M11
2125	M11
2126	G 9
2127	G10
2128	C11
2129	C 9
2130	H17
2131	I10
2132	I10
2133	H11
2134	J17
2135	J18
2136	J17
2137	J18
2138	H12
2139	H13
2140	H14
2141	H14
2142	H14
2143	I17
2144	H17
2145	G16
2146	F15
2147	F16
2148	F16
2149	C15
2150	B13
2152	F 7
2153	E 8
2154	E 7
2155	D 8
2158	M11
2159	F 9
2160	M12
2161	D16
2163	E16
2164	H14
2165	C 9
2166	G16
2167	F16
2168	I 13
3101	E 7
3102	E 7
3103	C 8
3104	B11
3105	C 7
3108	E 3
3109	F 2
3110	F 6
3113	C13
3119	B13
3120	C 6
3123	M 7
3125	M 6
3128	M 8
3132	L 9
3134	M12
3137	M13
3140	I13
3141	G10
3142	G 9
3143	I10
3144	I10
3145	H10
3146	I17
3147	I15
3152	H18
3153	H19
3154	H18
3155	H17
3156	G17
3157	F17
3158	F18
3159	F18
3160	E18
3161	E18
3167	G18
3169	G15
3170	F17
3171	H15
3175	B16
3176	J 9
3177	I18
3178	I15
3179	I16
3180	M7
4101	G 5
4102	F 5
4103	G 9
4104	B13
4105	B11
4106	K12
4108	L 9
5102	E 4
5103	F 4
5109	B13
5110	B14
5111	A13
5112	A15
5113	B12
5114	C16
5119	I 12
5120	H13
5121	F15
5122	M11
5123	L11
5130	E 8
5131	D 8
6103	C 2
6104	C 3
6105	K12
6105	E 6
6106	C 6
6107	H17
6120	G16
6130	E 7
6131	D 7
7101	G11
7102	D 8
7103	I 9
7104	E 3
7105	F 2
7109	M 7
7111	F18
7119	B13
7122	M 9
7124	M13
7125	I16
9100	B 4
9101	C 6
9117	L10
9128	A 4

MISCELLANEOUS

1101	4822 267 31505	Antenna Socket 300R	
1102	4822 267 10283	Antenna Socket Coax IEC 75R	

CAPACITORS

2101	5322 122 32531	100pF 5% 50V	
2101	4822 126 13692	47pF 1% 63V	for USA
2102	4822 122 33177	10nF 20% 50V	
2103	5322 122 34123	1nF 10% 50V	
2104	4822 122 33195	100pF 10% 50V	
2106	4822 125 50355	Trimmer 4-20pF	for LW version
2106	4822 125 60101	Trimmer 3-11pF 100V	
2107	4822 121 51319	1µF 10% 63V	
2108	5322 122 32531	100pF 5% 50V	for LW version
2109	5322 122 32448	10pF 5% 50V	for LW version
2120	4822 126 13691	27pF 1% 63V	for LW version
2120	5322 122 32658	22pF 5% 50V	
2122	4822 122 33891	3,3nF 10% 63V	for LW version
2125	4822 121 51381	560pF 5% 400V	
2126	5322 122 31863	330pF 5% 50V	
2127	4822 126 13473	220nF +80/-20% 50V	
2128	4822 124 41579	10µF 20% 50V	
2129	4822 124 41584	100µF 20% 10V	
2130	4822 126 11585	22nF+80/- 20% 25V	
2131	4822 122 33325	470nF 16V	
2132	4822 122 33325	470nF 16V	
2131	4822 126 13482	470nF +80/- 20% 16V	
2132	4822 126 13482	470nF +80/- 20% 16V	
2133	4822 124 40242	1µF 20% 63V	
2134	4822 126 13188	15nF 5% 63V	
2134	5322 122 32654	22nF 10% 63V	for USA
2135	4822 124 40746	0,22µF 20% 63V	
2136	4822 126 13188	15nF 5% 63V	
2136	5322 122 32654	22nF 10% 63V	for USA
2137	4822 124 40746	0,22µF 20% 63V	
2138	4822 124 41576	2,2µF 20% 50V	
2139	4822 126 14236	50V 15pF 5%	
2140	4822 121 51252	470nF 5% 63V	
2141	4822 126 10002	100nF 20% 25V	
2142	4822 126 10002	100nF 20% 25V	
2143	4822 126 13473	220nF +80/-20% 50V	
2144	4822 124 40242	1µF 20% 63V	
2145	4822 122 33575	220pF 5% 50V	
2146	4822 122 33575	220pF 5% 50V	
2147	4822 122 33575	220pF 5% 50V	
2148	4822 126 11585	22nF+80/- 20% 25V	
2149	5322 122 32654	22nF 10% 63V	
2150	4822 122 31947	100nF 20% 63V	
2152	5322 116 80853	560pF 5% 63V	for East. Europe
2152	4822 126 12105	33nF 5% 63V	
2153	4822 122 32139	12pF 2% 63V	for East. Europe
2153	4822 122 32504	15pF 2% 63V	
2155	4822 125 60101	Trimmer 3-11pF 100V	
2158	5322 122 32448	10pF 5% 50V	for LW version
2159	5322 122 32659	33pF 5% 50V	
2160	5322 122 32654	22nF 10% 63V	
2161	4822 126 10002	100nF 20% 25V	
2163	4822 126 10002	100nF 20% 25V	
2164	4822 126 13482	470nF +80/- 20% 16V	
2165	4822 126 10002	100nF 20% 25V	
2166	5322 122 34123	1nF 10% 50V	
2167	4822 122 32139	12pF 2% 63V	
2168	4822 126 13695	82pF 1% 63V	

RESISTORS

3101	4822 051 20562	5k6 5% 0,1W	for East. Europe
3101	4822 051 20333	33k 5% 0,1W	
3102	4822 051 20104	100k 5% 0,1W	
3103	4822 117 10965	18k 1% 0,1W	
3104	4822 117 11448	180R 1% 0,1W	
3105	4822 116 83872	220R 5% 0,5W	
3108	4822 117 11449	2k2 1% 0,1W	for LW version
3109	4822 051 20472	4k7 5% 0,1W	for LW version
3110	4822 116 52195	47R 5% 0,5W	
3120	4822 051 20008	0R Jumper 0805	
3123	4822 051 20472	4k7 5% 0,1W	for LW version
3125	4822 117 10833	10k 1% 0,1W	for LW version
3128	4822 117 11449	2k2 1% 0,1W	for LW version
3132	4822 116 52195	47R 5% 0,5W	
3134	4822 051 20224	220k 5% 0,1W	
3137	4822 051 20223	22k 5% 0,1W	for LW version
3140	4822 051 20008	0R Jumper 0805	
		5120=CDA10.7MG40K	
3140	4822 117 10353	150R 1% 0,1W	
		5120=CDA10.7MG61KA	
3141	4822 051 20563	56k 5% 0,1W	
3142	4822 100 11163	Trimmer 100k 30% 0,1W	
3143	4822 051 20223	22k 5% 0,1W	for RDS version
3144	4822 051 10102	1k 2% 0,25W	for RDS version
3145	4822 117 11449	2k2 1% 0,1W	
3146	4822 051 20229	22R 5% 0,1W	
3152	4822 116 83883	470R 5% 0,5W	
3153	4822 051 20471	470R 5% 0,1W	
3154	4822 116 83868	150R 5% 0,5W	
3155	4822 051 20471	470R 5% 0,1W	
3156	4822 051 20104	100k 5% 0,1W	for /21/30/33 only
3157	4822 116 52234	100k 5% 0,5W	for East. Europe
3158	4822 116 83883	470R 5% 0,5W	
3159	4822 116 83883	470R 5% 0,5W	
3160	4822 116 83883	470R 5% 0,5W	
3161	4822 116 83883	470R 5% 0,5W	
3167	4822 117 11503	220R 1% 0.1W	
3169	4822 051 20154	150k 5% 0,1W	
3170	4822 116 52234	100k 5% 0,5W	
3171	4822 116 52219	330R 5% 0,5W	

3176	4822 051 10102	1k 2% 0,25W	for RDS version
4101	4822 051 20008	0R Jumper 0805	for 2-Band only
4102	4822 051 20008	0R Jumper 0805	for 2-Band only
4103	4822 051 20008	0R Jumper 0805	
4104	4822 051 20008	0R Jumper 0805	
4105	4822 051 20008	0R Jumper 0805	
4106	4822 051 20008	0R Jumper 0805	
4108	4822 051 20008	0R Jumper 0805	
4111	4822 051 20008	0R Jumper 0805	
4120	4822 051 20008	0R Jumper 0805	
4150	4822 051 10008	0R Jumper 1206	
4151	4822 051 20008	0R Jumper 0805	
4152	4822 051 10008	0R Jumper 1206	
4153	4822 051 10008	0R Jumper 1206	
4154	4822 051 10008	0R Jumper 1206	
4155	4822 051 10008	0R Jumper 1206	
4156	4822 051 20008	0R Jumper 0805	
4157	4822 051 10008	0R Jumper 1206	
4158	4822 051 10008	0R Jumper 1206	
4159	4822 051 10008	0R Jumper 1206	
4162	4822 051 10008	0R Jumper 1206	

COILS & FILTERS

5102	4822 157 71634	MW RF Coil	
5103	4822 157 71635	LW RF Coil	for LW version
5109	4822 242 70665	Ceram Filter 10,7MHz	
5110	4822 242 70665	Ceram Filter 10,7MHz	
5111	4822 158 60511	AM-IF Filter 450kHz	
5112	4822 157 70302	AM-IF Filter 450kHz	
5114	4822 157 70302	AM-IF Filter 450kHz	
5119	4822 157 11443	Discriminator 10,7MHz	
5120	4822 242 82065	Cer. Disc. 10,7MG40K	
5120	4822 242 10251	Cer. Disc.10,7MG61KA-TF21	
5121	4822 242 10261	Quartz 75kHz	
5122	4822 157 60517	Osc. Coil LW	for LW version
5123	4822 157 60517	Osc. Coil MW	
5130	4822 156 30947	RF-Coil 1.5T	
5131	4822 156 30947	RF-Coil 1.5T	

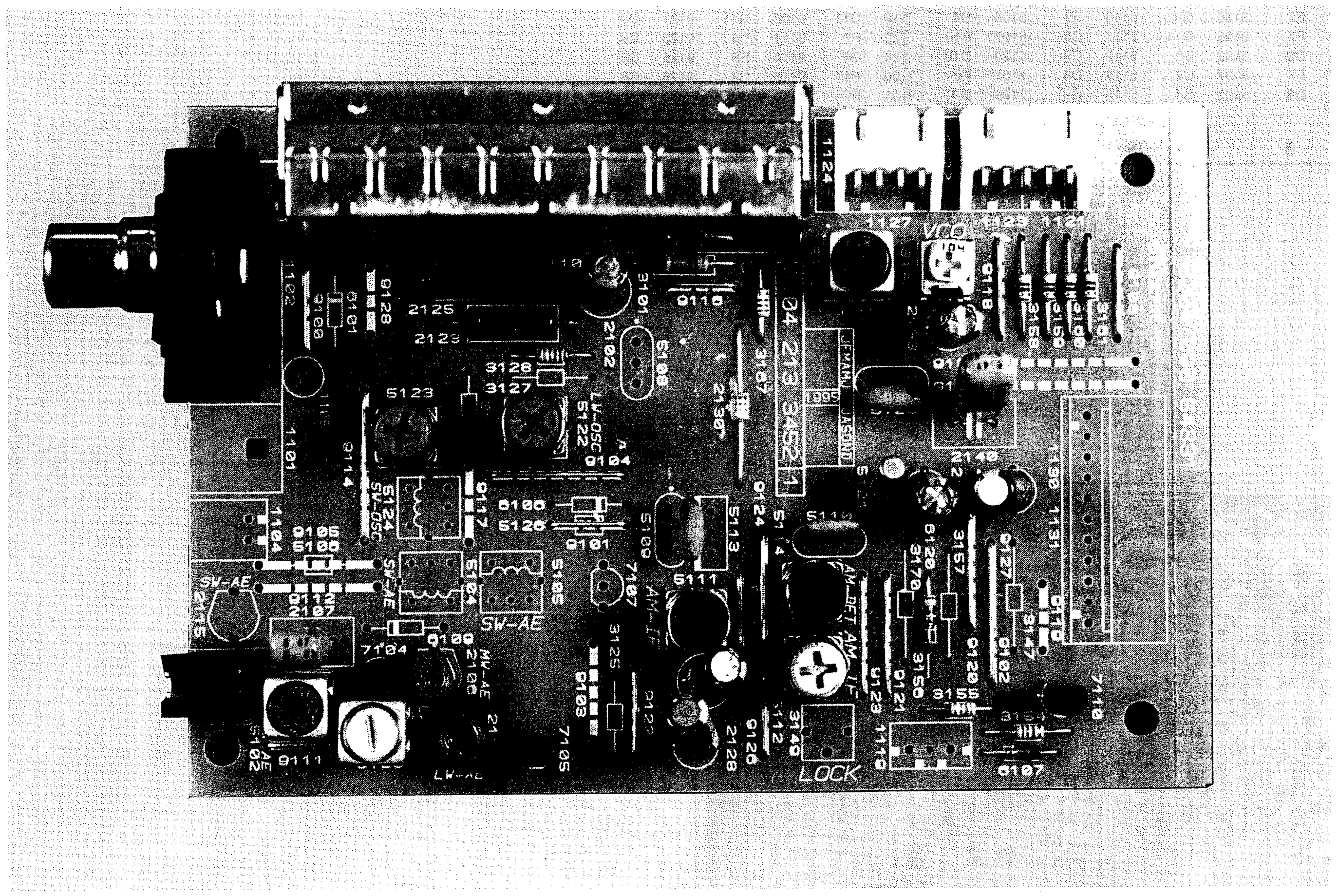
DIODES

6103	4822 130 30621	1N4148	
6104	4822 130 30621	1N4148	
6105	4822 130 83075	HN1V02H-B	
6106	4822 130 30621	1N4148	
6107	4822 130 34488	BZX79-B11	
6120	4822 130 30621	1N4148	not for /21/30/33
6130	4822 130 82833	1SV228	
6131	4822 130 82833	1SV228	

TRANSISTORS & INTEGRATED CIRCUITS

7101	4822 209 90924	TEA5757H/V1	
7102	4822 130 60093	2SA838B	
7103	4822 130 42513	BC858C	for RDS version
7104	5322 130 44779	BC338-40	for LW version
7105	5322 130 44779	BC338-40	for LW version
7109	5322 130 41983	BC858B	for LW version
7111	5322 130 42136	BC848C	
7122	5322 130 42136	BC848C	for LW version
7124	5322 130 42136	BC848C	for LW version

Note: Only the parts mentioned in this list are normal service spare parts.


VCO
SW-AE
LW-AE
MW-AE
SW-OSC
LW-OSC
AM-IF
LOCK

TUNER 95 BOARD

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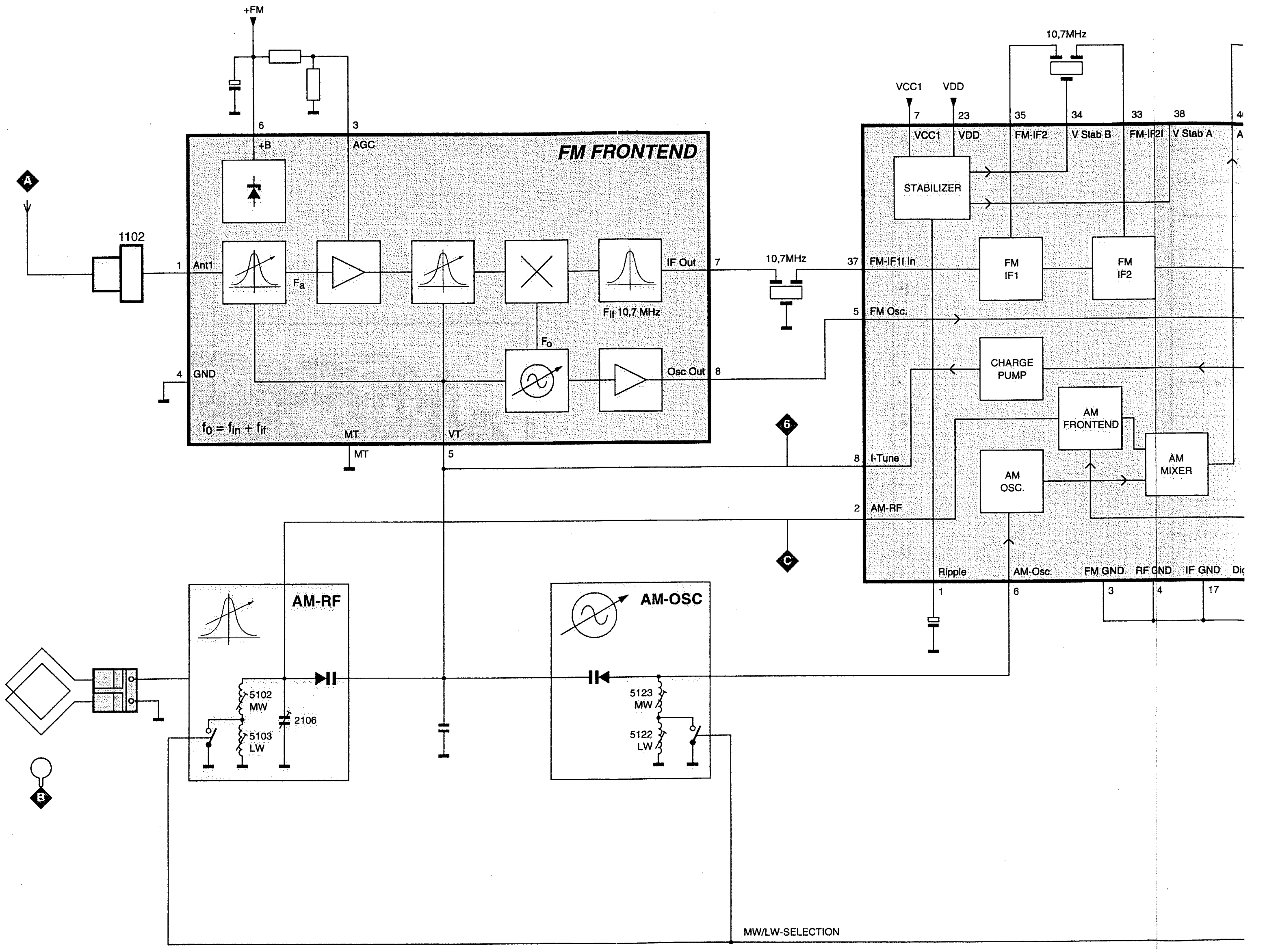
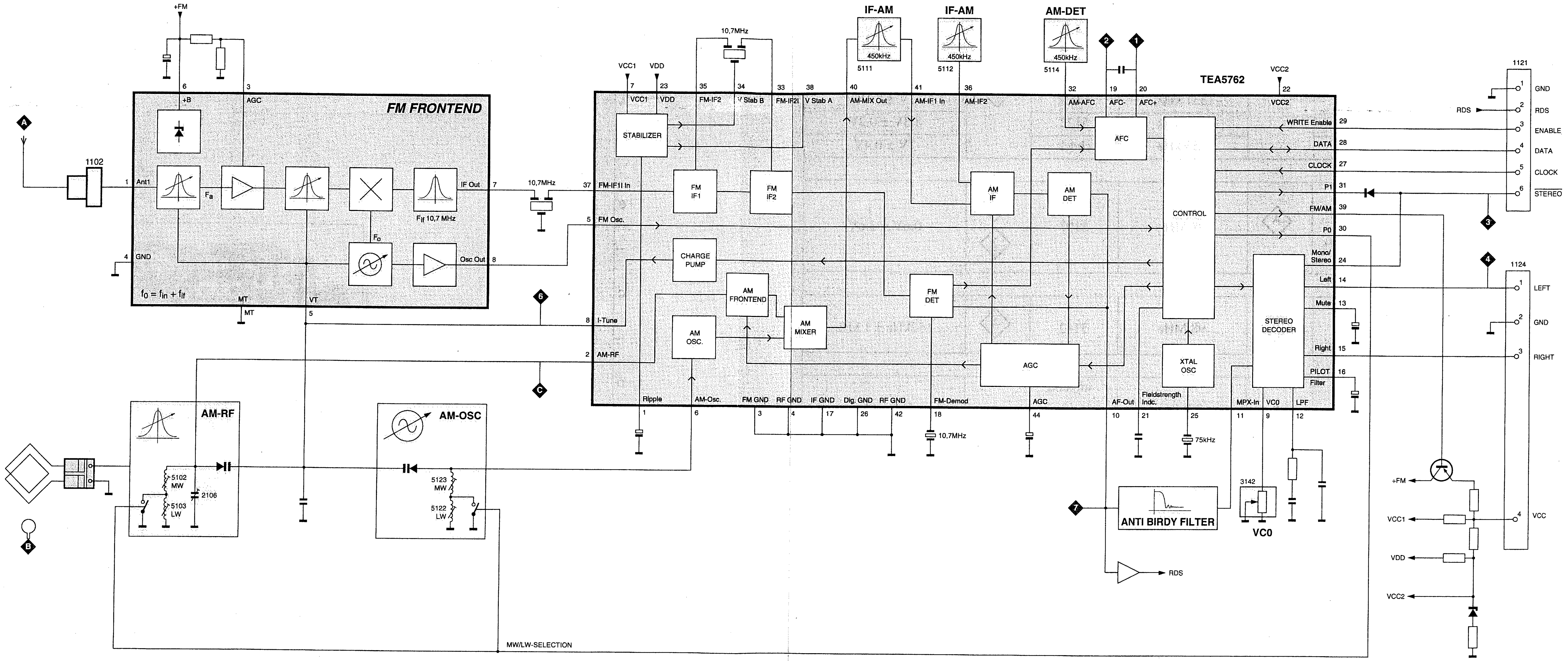
Adjustmant table 7D-2
Component layout..7D-2
Circuit diagram...7D-3
Partslist 7D-4

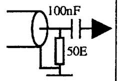
BLOCKDIAGRAM


+FM
6
3
+B
AGC
FM FRONTEND
A
1102
1
Ant1
Fa
IF Out
7
Fif 10,7 MHz
Fo
Osc Out
8
4
GND
f0 = fin + fif
MT
VT
5
10,7MHz
37
FM-IF1 In
5
FM Osc.
8
I-Tune
2
AM-RF
B
C
VCC1
VDD
7
23
35
34
33
38
VCC1
VDD
FM-IF2
V Stab B
FM-IF2I
V Stab A
10,7MHz
STABILIZER
FM IF1
FM IF2
CHARGE PUMP
AM FRONTEND
AM OSC.
AM MIXER
Ripple
AM-Osc.
FM GND
RF GND
IF GND
1
6
3
4
17
AM-RF
5102 MW
5103 LW
2106
AM-OSC
5123 MW
5122 LW
MW/LW-SELECTION

BLOCKDIAGRAM


+FM
FM FRONTEND
+B
AGC
1102
Ant1
GND
F_a
IF Out
F_{if} 10,7 MHz
F_o
Osc Out
$f_0 = f_{in} + f_{if}$
MT
VT
10,7MHz
IF-AM
450kHz
5111
5112
AM-DET
5114
TEA5762
VCC1
VDD
VCC2
FM-IF2
V Stab B
FM-IF2I
V Stab A
AM-MIX Out
AM-IF1 In
AM-IF2
AM-AFC
AFC-
AFC+
STABILIZER
FM IF1
FM IF2
AM IF
AM DET
AFC
CONTROL
CHARGE PUMP
AM FRONTEND
AM MIXER
AM OSC.
FM DET
AGC
XTAL OSC
STEREO DECODER
FM-IF1I In
FM Osc.
I-Tune
AM-RF
WRITE Enable
DATA
CLOCK
P1
FM/AM
P0
Mono/ Stereo
Left
Mute
Right
PILOT Filter
Ripple
AM-Osc.
FM GND
RF GND
IF GND
Dig. GND
FM-Demod
AGC
AF-Out
Fieldstrength Indc.
MPX-In
VC0
LPF
75kHz
3142
ANTI BIRDY FILTER
VCO
RDS
1121
GND
RDS
ENABLE
DATA
CLOCK
STEREO
1124
LEFT
GND
RIGHT
+FM
VCC1
VDD
VCC2
VCC
AM-RF
5102 MW
5103 LW
2106
AM-OSC
5123 MW
5122 LW
MW/LW-SELECTION
A
B
C
1
2
3
4
6
7

TUNER 95 bis Adjustment Table (FM, MW, LW with Frame antenna)

Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
VARICAP ALIGNMENT						
FM (50)			108 MHz	check	6	7 ... 9V
87.5 - 108 MHz			87.5 MHz	check		1.3 ... 2V
MW (9)			1602 kHz	5123		8.3V ± 0.2V
531 - 1602 kHz			531 kHz	check		1V ± 0.4V
LW (3)			279 kHz	5122		8.3V ± 0.2V
153 - 279 kHz			153 kHz	check		1V ± 0.4V
FM – DETECTION						
FM	98 MHz 1mV continuous wave *short pin 21 (IC7101) to ground*	A	98 MHz	5107	1 2	0mV ± 3mV
FM – VCO						
FM	98 MHz 1 mV continuous wave	A	98 MHz	3142	3	152kHz ± 1 kHz
DISTORTION						
FM	98 MHz 1 mV 90 % L + 9 % pilot mod = 1kHz	A	98MHz	mixcoil inside Tuner 1110	4	Distortion minimum
AM – IF						
MW	450kHz Δf = 10kHz Low as possible Swept signal	 C	MW	5111	7	symmetrical and max. height ↕
				5112		
	450kHz continuous wave			5114	1 2	0mV ± 2mV
AM - RF						
MW	558kHz Mod = 1kHz 30 % AM 1494 kHz	B *	558kHz	5102	7	MAX ↕
			1494kHz	2106		
LW	198kHz mod = 1kHz 30 % AM		198kHz	5103		MAX

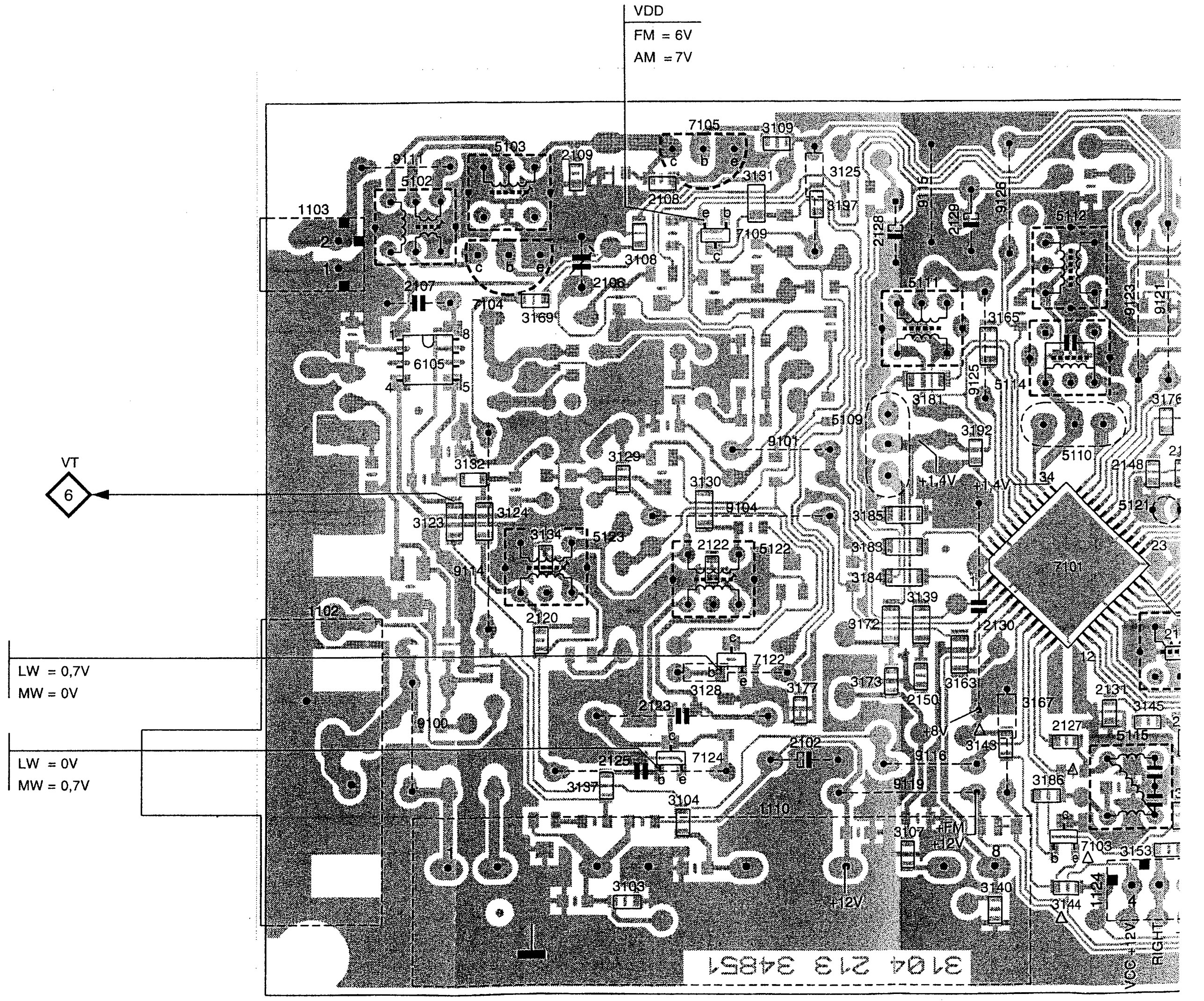
* Signal send via a frame antenna
(..) = tuning grid in kHz

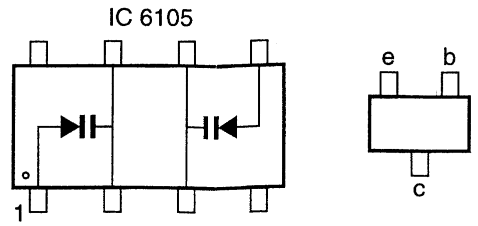
↕ repeat

adjtable for 3104 217 04121/04341

1102	F4	2107	C4	2128	C7	2136	G10	2145	G11	2161	E9	3124	E5	3137	G5	3145	F9	3158	G11	3167	F8	3183	E7	5103	C
1103	C3	2108	C6	2129	C8	2137	E11	2147	G11	2162	C11	3125	C7	3138	D9	3146	B10	3159	G11	3169	D5	3184	E7	5107	F
1110	G7	2109	C5	2130	F8	2138	E10	2148	E9	3103	H6	3128	F6	3139	F8	3150	C11	3160	G11	3171	D11	3185	E7	5109	D
1121	H11	2120	F5	2131	F9	2140	F10	2150	F8	3104	G6	3129	E6	3140	H8	3151	C10	3161	G11	3172	F7	3186	G8	5110	E
1124	H9	2122	E6	2132	F9	2141	E10	2151	F9	3107	G7	3130	E6	3141	G9	3152	G9	3162	D9	3173	F7	3188	G11	5111	C
1126	G10	2123	F6	2133	F10	2142	E9	2152	F9	3108	C6	3131	C6	3142	G10	3153	G9	3163	F8	3176	D9	3192	D8	5112	C
2102	G7	2125	G5	2134	G10	2143	C10	2158	D10	3109	B7	3132	E5	3143	G8	3154	C10	3164	C11	3177	F7	3197	C7	5114	D
2106	C5	2127	F9	2135	G11	2144	E10	2160	E9	3123	E4	3134	E5	3144	H8	3155	C10	3165	D8	3181	D8	5102	C4	5115	G

TUNER 95 bis Combi: Copper side view

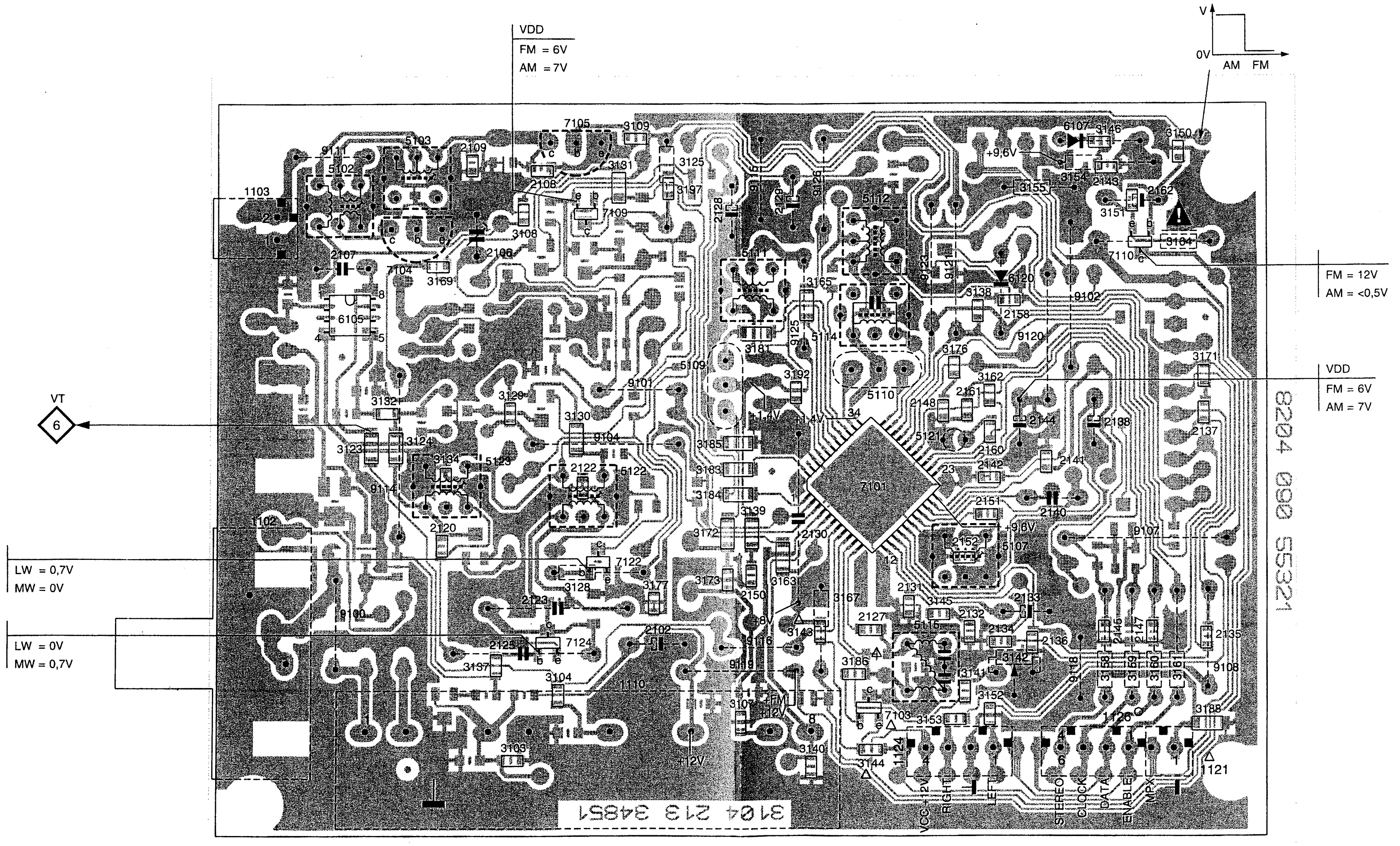

1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
G
H
I
J
VDD
FM = 6V
AM = 7V
VT
6
LW = 0,7V
MW = 0V
LW = 0V
MW = 0,7V
1103
1102
5103
5102
2109
7105
3109
3131
3125
3197
2128
2108
7109
3108
2107
7103
3169
2106
6105
3132
3129
3130
3101
3123
3124
3134
5123
2122
5122
3104
2120
7122
3128
2123
2125
7124
3137
2102
3104
3103
1110
3185
3163
3184
3139
3172
3173
2150
3163
3167
2127
3145
5115
3186
7103
3153
3140
3144
5109
3181
3192
5110
5114
3165
7101
2130
2131
3176
3116
3107
+12V
VCC
RIGHT
3104 213 34851


IC 6105
1
e
b
c

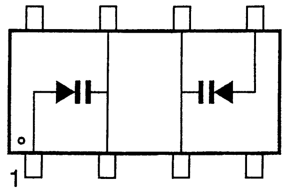
TUNER 95 bis
3104 217 04121/04341 bl. 110 - 01

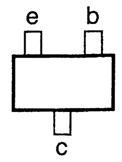
1102	F4	2107	C4	2128	C7	2136	G10	2145	G11	2161	E9	3124	E5	3137	G5	3145	F9	3158	G11	3167	F8	3183	E7	5103	C5	5121	E9	7104	D5	9102	D10	9118	G10
1103	C3	2108	C6	2129	C8	2137	E11	2147	G11	2162	C11	3125	C7	3138	D9	3146	B10	3159	G11	3169	D5	3184	E7	5107	F10	5122	E7	7105	B6	9104	E6	9119	G7
1110	G7	2109	C5	2130	F8	2138	E10	2148	E9	3103	H6	3128	F6	3139	F8	3150	C11	3160	G11	3171	D11	3185	E7	5109	D7	5123	E5	7109	C6	9107	F11	9120	D10
1121	H11	2120	F5	2131	F9	2140	F10	2150	F8	3104	G6	3129	E6	3140	H8	3151	C10	3161	G11	3172	F7	3186	G8	5110	E9	6105	D4	7110	D11	9108	G11	9121	D9
1124	H9	2122	E6	2132	F9	2141	E10	2151	F9	3107	G7	3130	E6	3141	G9	3152	G9	3162	D9	3173	F7	3188	G11	5111	C8	6107	B10	7122	F7	9111	C4	9123	D9
1126	G10	2123	F6	2133	F10	2142	E9	2152	F9	3108	C6	3131	C6	3142	G10	3153	G9	3163	F8	3176	D9	3192	D8	5112	C9	6120	D10	7124	G6	9114	E5	9125	D8
2102	G7	2125	G5	2134	G10	2143	C10	2158	D10	3109	B7	3132	E5	3143	G8	3154	C10	3164	C11	3177	F7	3197	C7	5114	D8	7101	E9	9100	F4	9115	C8	9126	C8
2106	C5	2127	F9	2135	G11	2144	E10	2160	E9	3123	E4	3134	E5	3144	H8	3155	C10	3165	D8	3181	D8	5102	C4	5115	G9	7103	G9	9101	E7	9116	G8		

TUNER 95 bis Combi: Copper side view


VDD
FM = 6V
AM = 7V
V
0V
AM FM
FM = 12V
AM = <0,5V
VDD
FM = 6V
AM = 7V
VT
6
LW = 0,7V
MW = 0V
LW = 0V
MW = 0,7V
+9,6V
+12V
8204 090 55321
3104 213 34851
VCC+12V
RIGHT
LEFT
STEREO
CLOCK
DATA
ENABLE
MPX
7101
6105
1103
1121

IC 6105



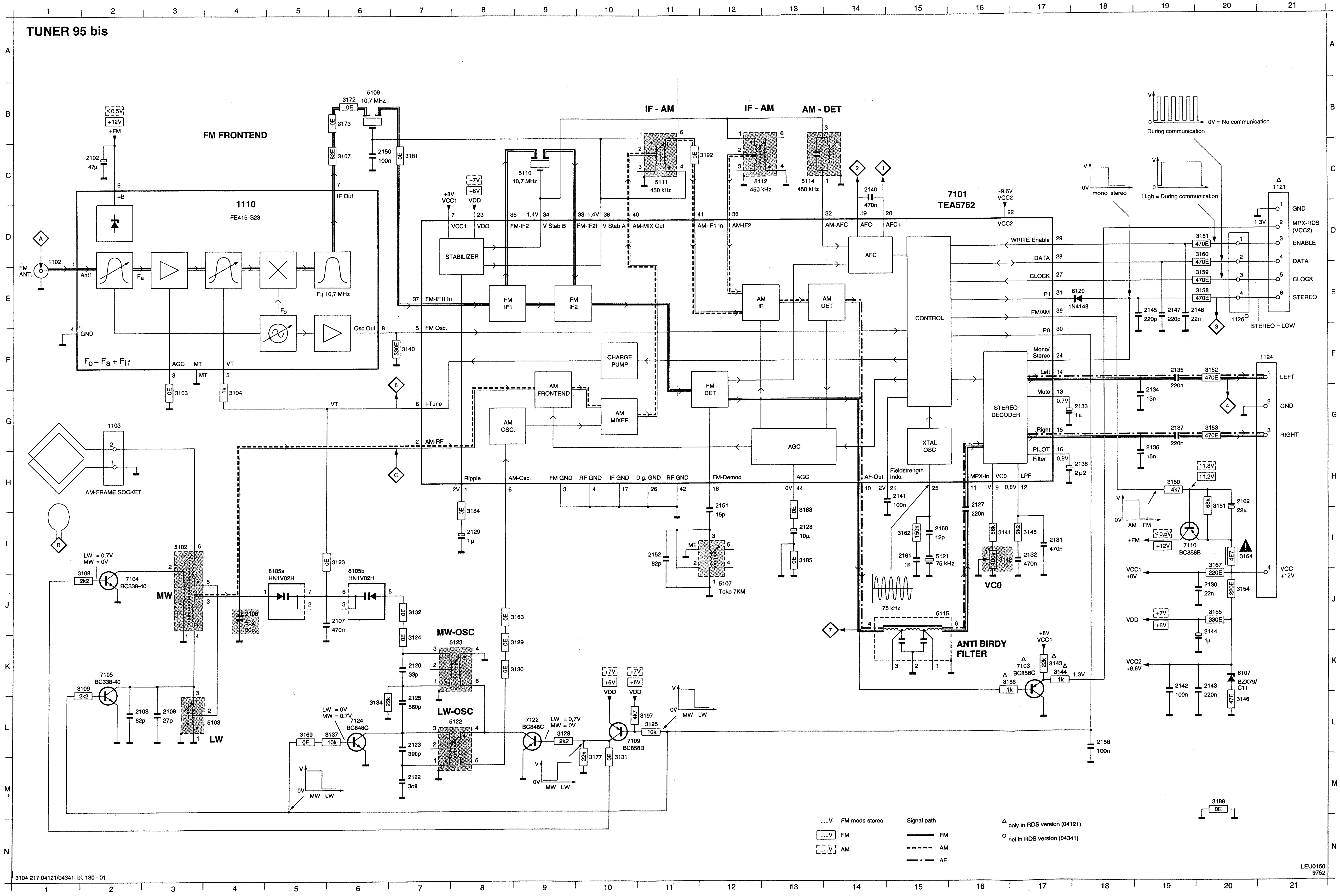


△ only in RDS version (04121)

○ not in RDS version (04341)

Part	Location
1102	D1
1103	G2
1110	D4
1121	C21
1124	F21
1126	E20
2102	C2
2106	J4
2107	J6
2108	L2
2109	L3
2120	K7
2122	M7
2123	L7
2125	L7
2127	H16
2128	I13
2129	I8
2130	J20
2131	I17
2132	I17
2133	G18
2134	G19
2135	F19
2136	H19
2137	G19
2138	H18
2140	C14
2141	H15
2142	K19
2143	K20
2144	K20
2145	E19
2147	E19
2148	E19
2150	C6
2151	H12
2152	I11
2158	L18
2160	I15
2161	I15
2162	H20
3103	G3
3104	G4
3107	C6
3108	J1
3109	K1
3123	I6
3124	K7
3125	L11
3128	L9
3129	K8
3130	K8
3131	M10
3132	J7
3134	L6
3137	L5
3140	F7
3141	I16
3142	I16
3143	K17
3144	K17
3145	I17
3146	L20
3150	H19
3151	I20
3152	F20
3153	G20
3154	J20
3155	J20
3158	E19
3159	E19
3160	D19
3161	D19
3162	I15
3163	J8
3164	I20
3167	I20
3169	L5
3172	B6
3173	B6
3177	M10
3181	C7
3183	I13
3184	I8
3185	I13
3186	K16
3188	M20
3192	C12
3197	L11
5102	I3
5103	L4
5107	J12
5109	B6
5110	C9
5111	C11
5112	C12
5114	C13
5115	J15
5121	I15
5122	L7
5123	K7
6105a	I5
6105b	I6
6107	K20
6120	E17
7101	C15
7103	K17
7104	J2
7105	K2
7109	L10
7110	I19
7122	L9
7124	L6

TUNER 95 bis


FM FRONTEND
1110
FE415-G23
FM ANT.
Ant1
IF Out
Osc Out
GND
AGC
MT
VT
F_o = F_a + F_if
F_if 10,7 MHz
5109
10,7 MHz
IF - AM
IF - AM
AM - DET
5110
10,7 MHz
5111
450 kHz
5112
450 kHz
5114
450 kHz
7101
TEA5762
STABILIZER
FM IF1
FM IF2
CHARGE PUMP
AM FRONTEND
AM MIXER
AM OSC.
FM DET
AM IF
AM DET
AFC
AGC
CONTROL
STEREO DECODER
XTAL OSC
VCC1
VDD
FM-IF2
V Stab B
FM-IF2I
V Stab A
AM-MIX Out
AM-IF1 In
AM-IF2
AM-AFC
AFC-
AFC+
VCC2
WRITE Enable
DATA
CLOCK
P1
FM/AM
P0
Mono/Stereo
Left
Mute
Right
PILOT
Filter
FM-IF1I In
FM Osc.
I-Tune
AM-RF
Ripple
AM-Osc.
FM GND
RF GND
IF GND
Dig. GND
RF GND
FM-Demod
AF-Out
Fieldstrength Indc.
MPX-In
VCO
LPF
1121
GND
MPX-RDS (VCC2)
ENABLE
DATA
CLOCK
STEREO
STEREO = LOW
1124
LEFT
GND
RIGHT
VCC +12V
0V = No communication
During communication
High = During communication
mono stereo
AM-FRAME SOCKET
1103
MW
LW
MW-OSC
5123
LW-OSC
5122
6105a HN1V02H
6105b HN1V02H
5107 Toko 7KM
ANTI BIRDY FILTER
5115
75 kHz
VCO
7104 BC338-40
7105 BC338-40
7124 BC848C
7122 BC848C
7109 BC858B
7110 BC858B
7103 BC858C
6107 BZX79/C11
6120 1N4148
LW = 0,7V
MW = 0V
LW = 0V
MW = 0,7V
MW LW
VCC1 +8V
VDD
VCC2 +9,6V
....V FM mode stereo
....V FM
....V AM
Signal path
FM
AM
AF
Δ only in RDS version (04121)
o not in RDS version (04341)
3104 217 04121/04341 bl. 130 - 01
LEU0150
9752

ELECTRICAL PARTS LIST - TUNER 95 BOARD

MISCELLANEOUS

1102	4822 267 10283	Socket Coaxial IEC 75R
1103	4822 265 31184	JST Connector 2 pin
1110	4822 210 10739	Frontend Assembly FE415-G23

CAPACITORS

2102	4822 124 40433	47µF 20% 25V
2106	4822 125 60102	Trimmer 5,2-30pF 100V
2107	4822 121 51252	470nF 5% 63V
2108	4822 126 13695	82pF 1% 63V
2109	4822 126 13691	27pF 1% 63V
2120	5322 122 32659	33pF 5% 50V
2122	5322 126 10465	3,9nF 10% 63V
2125	4822 121 10578	560P 1% 630V
2127	4822 122 32927	220nF +80/-20% 50V
2128	4822 124 41579	10µF 20% 50V
2129	4822 124 40242	1µF 20% 63V
2130	4822 126 11585	22nF +80/-20% 25V
2131	4822 122 33325	470nF 16V
2132	4822 122 33325	470nF 16V
2133	4822 124 40242	1µF 20% 63V
2134	4822 126 13188	15nF 5% 63V
2135	4822 122 32927	220nF +80/-20% 50V
2136	4822 126 13188	15nF 5% 63V
2137	4822 122 32927	220nF +80/-20% 50V
2138	4822 124 41576	2,2µF 20% 50V
2140	4822 121 51252	470nF 5% 63V
2141	4822 122 31947	100nF 20% 63V
2142	4822 122 31947	100nF 20% 63V
2143	4822 122 32927	220nF +80/-20% 50V
2144	4822 124 40242	1µF 20% 63V
2145	4822 122 33575	220pF 5% 50V
2147	4822 122 33575	220pF 5% 50V
2148	4822 122 33809	22nF 20% 50V
2150	4822 122 31947	100nF 20% 63V
2151	4822 126 14236	50V 15pF 5%
2152	4822 126 13695	82pF 1% 63V
2158	4822 122 31947	100nF 20% 63V
2160	4822 122 32139	12pF 2% 63V
2161	5322 122 34123	1nF 10% 50V
2162	4822 124 81151	22µF 50V

RESISTORS

3103	4822 051 20008	0R Jumper 0805
3104	4822 051 10102	1k 2% 0,25W
3107	4822 051 20829	82R 5% 0,1W
3108	4822 117 11449	2k2 1% 0,1W
3109	4822 117 11449	2k2 1% 0,1W
3123	4822 051 10008	0R 5% 0,25W
3124	4822 051 10008	0R 5% 0,25W
3125	4822 116 83864	10k 5% 0,5W
3128	4822 116 52256	2k2 5% 0,5W
3129	4822 051 20008	0R Jumper 0805
3130	4822 051 10008	0R 5% 0,25W
3131	4822 051 10008	0R 5% 0,25W
3132	4822 051 20008	0R Jumper 0805
3134	4822 051 20223	22k 5% 0,1W
3137	4822 117 10833	10k 1% 0,1W
3138	4822 051 20008	0R Jumper 0805
3139	4822 051 10008	0R 5% 0,25W
3140	4822 051 20331	330R 5% 0,1W
3141	4822 051 20563	56k 5% 0,1W
3142	4822 100 11163	Trimmer 100k 30% 0,1W
3143	4822 051 20223	22k 5% 0,1W
3144	4822 051 10102	1k 2% 0,25W
3145	4822 117 11449	2k2 1% 0,1W
3146	4822 051 20479	47R 5% 0,1W
3150	4822 051 20472	4k7 5% 0,1W
3151	4822 051 20683	68k 5% 0,1W
3152	4822 051 20471	470R 5% 0,1W
3153	4822 051 20471	470R 5% 0,1W
3154	4822 116 83872	220R 5% 0,5W
3155	4822 116 52219	330R 5% 0,5W
3158	4822 116 83883	470R 5% 0,5W
3159	4822 116 83883	470R 5% 0,5W
3160	4822 116 83883	470R 5% 0,5W
3161	4822 116 83883	470R 5% 0,5W
3162	4822 051 20224	220k 5% 0,1W
3163	4822 051 10008	0R 5% 0,25W
3164	4822 052 10478 ⚠	4R7 5% 0,33W
3165	4822 051 10008	0R 5% 0,25W
3167	4822 116 83872	220R 5% 0,5W
3169	4822 051 20008	0R Jumper 0805
3171	4822 051 20008	0R Jumper 0805
3172	4822 051 10008	0R 5% 0,25W
3173	4822 051 20008	0R Jumper 0805
3176	4822 051 20008	0R Jumper 0805
3177	4822 051 20223	22k 5% 0,1W
3181	4822 051 10008	0R 5% 0,25W
3183	4822 051 10008	0R 5% 0,25W
3184	4822 051 10008	0R 5% 0,25W
3185	4822 051 10008	0R 5% 0,25W
3186	4822 051 10102	1k 2% 0,25W
3188	4822 051 10008	0R 5% 0,25W
3192	4822 051 20008	0R Jumper 0805
3197	4822 051 20472	4k7 5% 0,1W

COILS & FILTERS

5102	4822 157 71634	MW AERIAL
5103	4822 157 71635	LW AERIAL
5107	4822 157 11443	FM Discriminator 10,7MHz
5109	4822 157 71639	Ceram Filter 10,7MHz
5110	4822 242 70665	Ceram Filter 10,7MHz
5111	4822 158 60511	AM-IF Filter 450kHz
5112	4822 157 70302	AM-IF Filter 450kHz

ELECTRICAL PARTS LIST - TUNER 95 BOARD

5114	4822 157 70302	AM-IF Filter 450kHz
5115	4822 157 71636	Anti-Birdy Filter
5121	4822 242 10261	X'tal Resonator 75kHz
5122	4822 157 60517	RF Coil AM
5123	4822 157 60517	RF Coil AM

DIODES

6105	4822 130 83075	HN1V02H-B
6107	4822 130 34488	BZX79-B11
6120	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

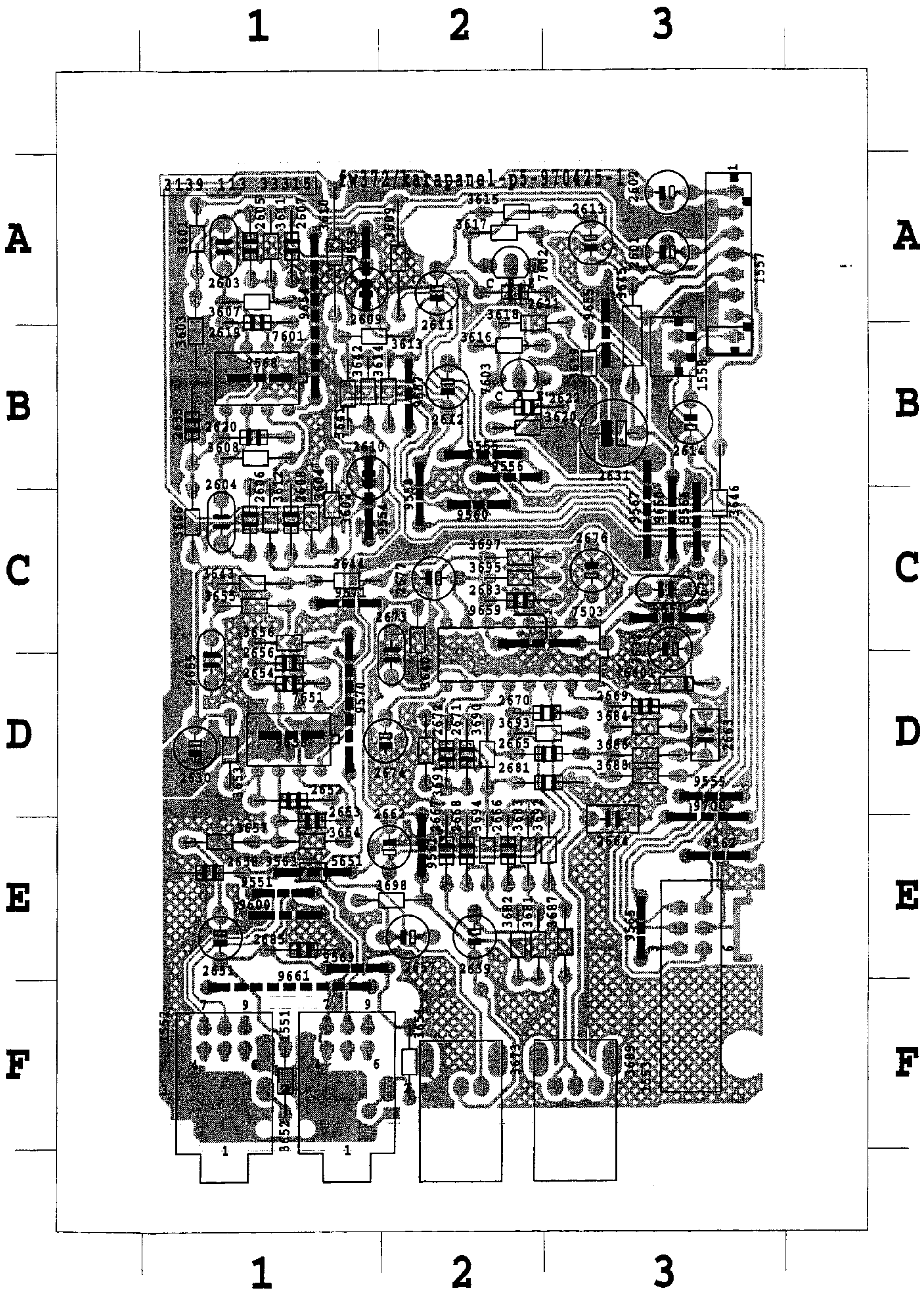
7101	4822 209 90315	TEA5762H/V1
7103	4822 130 42513	BC858C
7104	5322 130 44779	BC338-40
7105	5322 130 44779	BC338-40
7109	5322 130 41983	BC858B
7110	5322 130 41983	BC858B
7122	5322 130 42136	BC848C
7124	5322 130 42136	BC848C

Note: Only the parts mentioned in this list are normal service spare parts.

KARAOKE BOARD

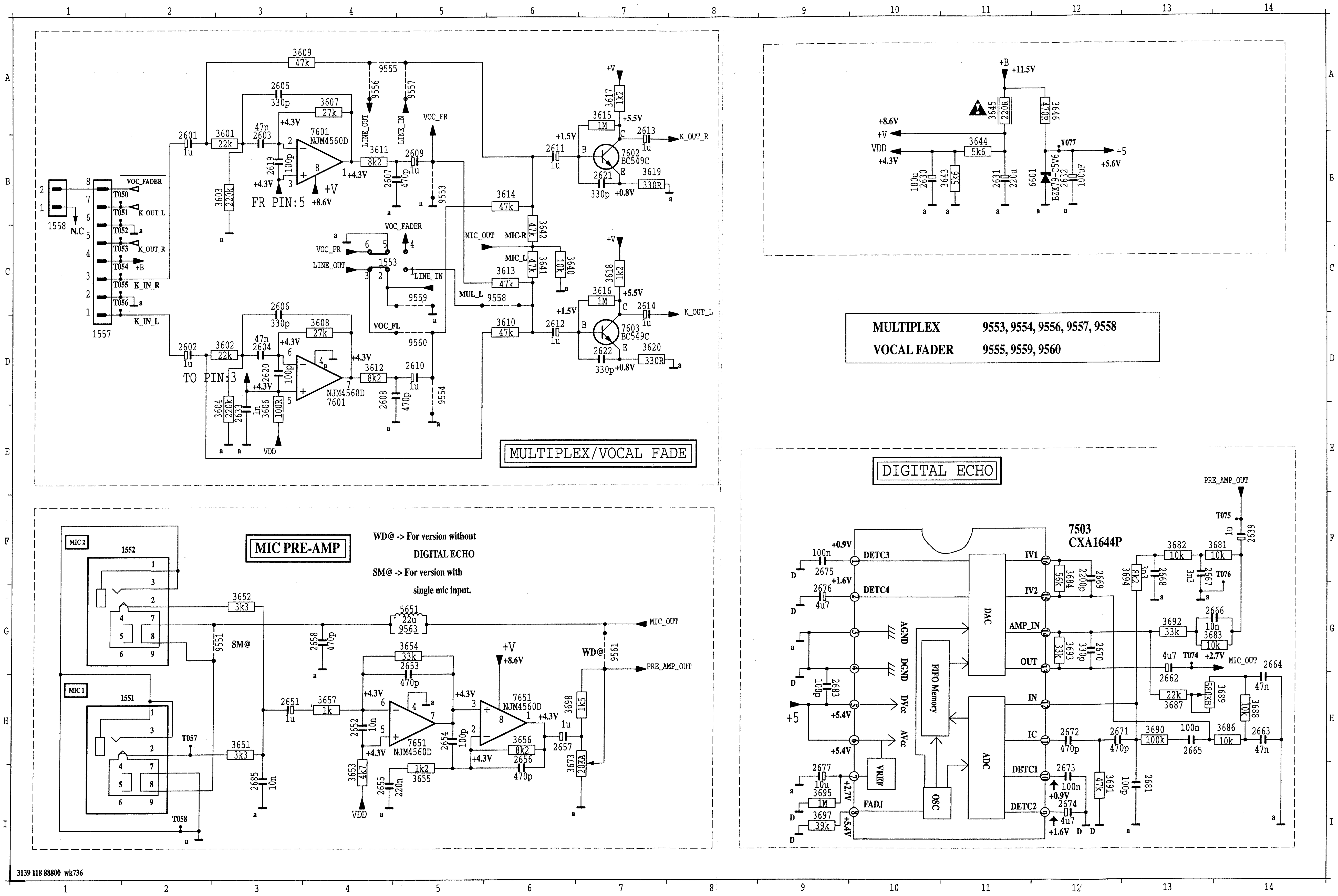
Component Layout .... 8 - 2
Circuit Diagram .... 8 - 3
Partlist .... 8 - 4

COMPONENT LAYOUT



1551	F	1
1552	F	1
1553	E	3
1557	A	3
1558	B	3
2601	A	3
2602	A	3
2603	A	1
2604	C	1
2605	A	1
2606	C	1
2607	A	1
2608	C	1
2609	A	1
2610	B	1
2611	A	2
2612	B	2
2613	A	3
2614	B	3
2619	A	1
2620	B	1
2621	A	2
2622	B	2
2630	D	1
2631	B	3
2632	C	3
2633	B	1
2639	E	2
2651	E	1
2652	D	1
2653	E	1
2654	D	1
2655	D	1
2656	D	1
2657	E	2
2658	E	1
2662	E	2
2663	D	3
2664	E	3
2665	D	3
2666	E	2
2667	E	2
2668	E	2
2669	D	3
2670	D	3
2671	D	2
2672	D	2
2673	D	2
2674	D	2
2675	C	3
2676	C	3
2677	C	2
2681	D	3
2683	C	2
2685	E	1
3601	A	1
3602	C	1
3603	B	1
3604	C	1
3606	C	1
3607	A	1
3608	B	1
3609	A	2
3610	A	1
3611	A	1
3612	C	1
3613	B	1
3614	B	2
3615	A	2
3616	B	2
3617	A	2
3618	B	2
3619	B	3
3620	B	2
3640	C	2
3641	B	1
3642	B	1
3643	C	1
3644	C	1
3645	B	3
3646	C	3
3651	F	2
3652	F	1
3653	D	1
3654	E	1
3655	C	1
3656	C	1
3657	E	1
3673	F	2
3681	E	2
3682	E	2
3683	E	2
3684	D	3
3686	D	3
3687	E	3
3688	D	3
3689	F	3
3690	D	2
3691	D	2
3692	E	3
3693	D	3
3694	E	2
3695	C	2
3697	C	2
3698	E	2
5651	E	1
6601	D	3
7503	D	2
7601	B	1
7602	A	2
7603	B	2
7651	D	1
9551	E	1
9553	A	1
9554	C	1
9555	B	2
9556	B	2
9557	B	2
9558	C	2
9559	D	3
9560	C	2
9561	E	2
9562	E	3
9563	E	1
9565	E	3
9566	C	3
9567	C	3
9568	B	1
9569	E	1
9570	D	1
9571	C	1
9600	E	1
9651	C	3
9654	A	1
9655	B	3
9658	D	1
9659	C	2
9660	C	3
9661	F	1
9700	E	3

KARAOKE CIRCUIT


MULTIPLEX/VOCAL FADE
MIC PRE-AMP
DIGITAL ECHO
7601 NJM4560D
7602 BC549C
7603 BC549C
7651 NJM4560D
7503 CXA1644P
1557
1558
1553
1552
1551
MIC2
MIC1
VOC_FADER
K_OUT_L
K_OUT_R
K_IN_R
K_IN_L
VOC_FR
VOC_FL
LINE_OUT
LINE_IN
MIC_OUT
MIC-R
MIC_L
MUL_L
FR PIN:5
TO PIN:3
N.C
PRE_AMP_OUT
WD@ -> For version without DIGITAL ECHO
SM@ -> For version with single mic input.
SM@
WD@
MULTIPLEX 9553, 9554, 9556, 9557, 9558
VOCAL FADER 9555, 9559, 9560
DETC3
DETC4
AGND
DGND
DVcc
AVcc
FADJ
IV1
IV2
AMP_IN
OUT
IN
IC
DETC1
DETC2
DAC
ADC
FIFO Memory
VREF
OSC
+8.6V
+4.3V
+11.5V
+5.6V
VDD
+5
3139 118 88800 wk736

1551	H 2
1552	F 2
1553	C 4
1557	D 1
1558	B 1
2601	B 2
2602	D 2
2603	B 3
2604	D 3
2605	A 3
2606	C 3
2607	B 4
2608	D 4
2609	B 5
2610	D 5
2611	B 6
2612	D 6
2613	A 7
2614	C 7
2619	B 3
2620	D 3
2621	B 7
2622	D 7
2630	B10
2631	B11
2632	B12
2633	E 3
2639	F14
2651	H 3
2652	H 4
2653	G 5
2654	H 5
2655	I 4
2656	H 6
2657	H 6
2658	G 4
2662	H13
2663	H14
2664	G14
2665	H13
2666	G14
2667	F13
2668	F13
2669	F12
2670	G12
2671	H12
2672	H12
2673	I12
2674	I12
2675	F 9
2676	G 9
2677	I 9
2681	I13
2683	H 9
2685	I 3
3601	B 3
3602	D 3
3603	B 3
3604	E 3
3606	E 3
3607	A 4
3608	D 4
3609	A 3
3610	D 6
3611	B 4
3612	D 4
3613	C 6
3614	B 6
3615	A 7
3616	C 7
3617	A 7
3618	C 7
3619	B 7
3620	D 7
3640	C 6
3641	C 6
3642	C 6
3643	B11
3644	B11
3645	A11
3646	A12
3651	H 3
3652	G 3
3653	I 4
3654	G 5
3655	I 5
3656	H 6
3657	H 4
3673	H 6
3681	F14
3682	F13
3683	G13
3684	F12
3686	H14
3687	H13
3688	H14
3689	H14
3690	H13
3691	I12
3692	G13
3693	G12
3694	F12
3695	I 9
3697	I 9
3698	H 6
5651	G 5
6601	B12
7503	F12
7601	A 4
7601	D 4
7602	B 7
7603	D 7
7651	H 6
7651	H 5
9551	G 2
9553	B 5
9554	D 5
9555	A 4
9556	A 4
9557	A 5
9558	C 6
9559	C 5
9560	D 5
9561	G 7
9563	G 5

ELECTRICAL PARTS LIST - KARAOKE BOARD

MISCELLANEOUS

1551	4822 267 40898	Mic Socket
1552	4822 267 40898	Mic Socket
1553	4822 276 12571	Vocal Fader Switch

CAPACITORS

2601	4822 124 40242	1µF 20% 63V
2602	4822 124 40242	1µF 20% 63V
2603	4822 121 43526	47nF 5% 250V
2604	4822 121 43526	47nF 5% 250V
2605	4822 126 12787	330pF 10% 50V
2606	4822 126 12787	330pF 10% 50V
2607	4822 122 33519	470pF 10% 50V
2608	4822 122 33519	470pF 10% 50V
2609	4822 124 40242	1µF 20% 63V
2610	4822 124 40242	1µF 20% 63V
2611	4822 124 40242	1µF 20% 63V
2612	4822 124 40242	1µF 20% 63V
2613	4822 124 40242	1µF 20% 63V
2614	4822 124 40242	1µF 20% 63V
2619	4822 122 33195	100pF 10% 50V
2620	4822 122 33195	100pF 10% 50V
2621	4822 126 12787	330pF 10% 50V
2622	4822 126 12787	330pF 10% 50V
2630	4822 124 41584	100µF 20% 10V
2631	4822 124 22263	220µF 20% 25V
2632	4822 124 41584	100µF 20% 10V
2633	4822 122 33197	1nF 10% 50V
2639	4822 124 40242	1µF 20% 63V
2651	4822 124 40242	1µF 20% 63V
2652	4822 121 51387	10nF 20% 16V
2653	4822 122 33519	470pF 10% 50V
2654	4822 122 33195	100pF 10% 50V
2655	4822 121 42408	220nF 5% 63V
2656	4822 122 33519	470pF 10% 50V
2657	4822 124 40242	1µF 20% 63V
2658	4822 122 33519	470pF 10% 50V
2662	4822 124 40246	4,7µF 20% 63V
2663	4822 121 43526	47nF 5% 250V
2664	4822 121 43526	47nF 5% 250V
2665	4822 126 12882	100nF +80-20% 50V
2666	4822 121 51387	10nF 20% 16V
2667	4822 122 10577	3,3nF 10% 16V
2668	4822 122 10577	3,3nF 10% 16V
2669	4822 126 12339	2200pF 10%
2670	4822 126 12787	330pF 10% 50V
2671	4822 122 33519	470pF 10% 50V
2672	4822 122 33519	470pF 10% 50V
2673	5322 121 42386	100nF 5% 63V
2674	4822 124 40246	4,7µF 20% 63V
2675	5322 121 42386	100nF 5% 63V
2676	4822 124 40246	4,7µF 20% 63V
2677	4822 124 41579	10µF 20% 50V
2681	4822 122 33195	100pF 10% 50V
2683	4822 122 33195	100pF 10% 50V
2685	4822 121 51387	10nF 20% 16V

RESISTORS

3601	4822 116 52257	22k 5% 0,5W
3602	4822 116 52257	22k 5% 0,5W
3603	4822 116 83874	220k 5% 0,5W
3604	4822 116 83874	220k 5% 0,5W
3606	4822 116 52175	100R 5% 0,5W
3607	4822 116 52264	27k 5% 0,5W
3608	4822 116 52264	27k 5% 0,5W
3609	4822 116 83884	47k 5% 0,5W
3610	4822 116 83884	47k 5% 0,5W
3611	4822 116 52303	8k2 5% 0,5W
3612	4822 116 52303	8k2 5% 0,5W
3613	4822 116 83884	47k 5% 0,5W
3614	4822 116 83884	47k 5% 0,5W
3615	4822 116 52235	1M 5% 0,5W
3616	4822 116 52235	1M 5% 0,5W
3617	4822 116 52207	1k2 5% 0,5W
3617	4822 116 52249	1k8 5% 0,5W (DPL version)
3618	4822 116 52207	1k2 5% 0,5W
3618	4822 116 52249	1k8 5% 0,5W (DPL version)
3619	4822 116 52219	330R 5% 0,5W
3619	4822 116 83883	470R 5% 0,5W (DPL version)
3620	4822 116 52219	330R 5% 0,5W
3620	4822 116 83883	470R 5% 0,5W (DPL version)
3640	4822 116 83864	10k 5% 0,5W
3641	4822 116 83884	47k 5% 0,5W
3642	4822 116 83884	47k 5% 0,5W
3643	4822 116 52289	5k6 5% 0,5W
3644	4822 116 52289	5k6 5% 0,5W
3645	4822 052 10221	⚠ 220R 5% 0,33W
3646	4822 116 83883	470R 5% 0,5W
3651	4822 116 52269	3k3 5% 0,5W
3652	4822 116 52269	3k3 5% 0,5W
3653	4822 116 52283	4k7 5% 0,5W
3654	4822 116 52271	33k 5% 0,5W
3655	4822 116 52207	1k2 5% 0,5W
3656	4822 116 52303	8k2 5% 0,5W
3656	4822 116 52264	27k 5% 0,5W (DPL version)
3657	4822 050 11002	1k 1% 0,4W
3673	4822 101 21204	Potm Rotary 20kB
3681	4822 116 83864	10k 5% 0,5W
3682	4822 116 83864	10k 5% 0,5W
3683	4822 116 83864	10k 5% 0,5W
3684	4822 116 52291	56k 5% 0,5W
3686	4822 116 83864	10k 5% 0,5W
3687	4822 116 83884	47k 5% 0,5W
3688	4822 116 83864	10k 5% 0,5W
3689	4822 101 11326	Potm Rotary 500k

ELECTRICAL PARTS LIST - KARAOKE BOARD

3690	4822 116 52234	100k 5% 0,5W
3691	4822 116 83884	47k 5% 0,5W
3692	4822 116 52271	33k 5% 0,5W
3693	4822 116 52271	33k 5% 0,5W
3694	4822 116 52303	8k2 5% 0,5W
3695	4822 116 52235	1M 5% 0,5W
3697	4822 116 83882	39k 5% 0,5W
3698	4822 116 52243	1k5 5% 0,5W

COILS

5651	4822 157 52983	COIL 22µH

DIODES

6601	4822 130 34173	BZX79-C5V6

TRANSISTORS & INTEGRATED CIRCUITS

7503	4822 209 33717	CXA1644P
7601	4822 209 83274	NJM4560D
7602	4822 130 41096	BC550C
7603	4822 130 41096	BC550C
7651	4822 209 83274	NJM4560D

NOTE: Only the parts mentioned in this list are normal service spare parts.

ETF5 TAPE MODULE

(Dolby Version)

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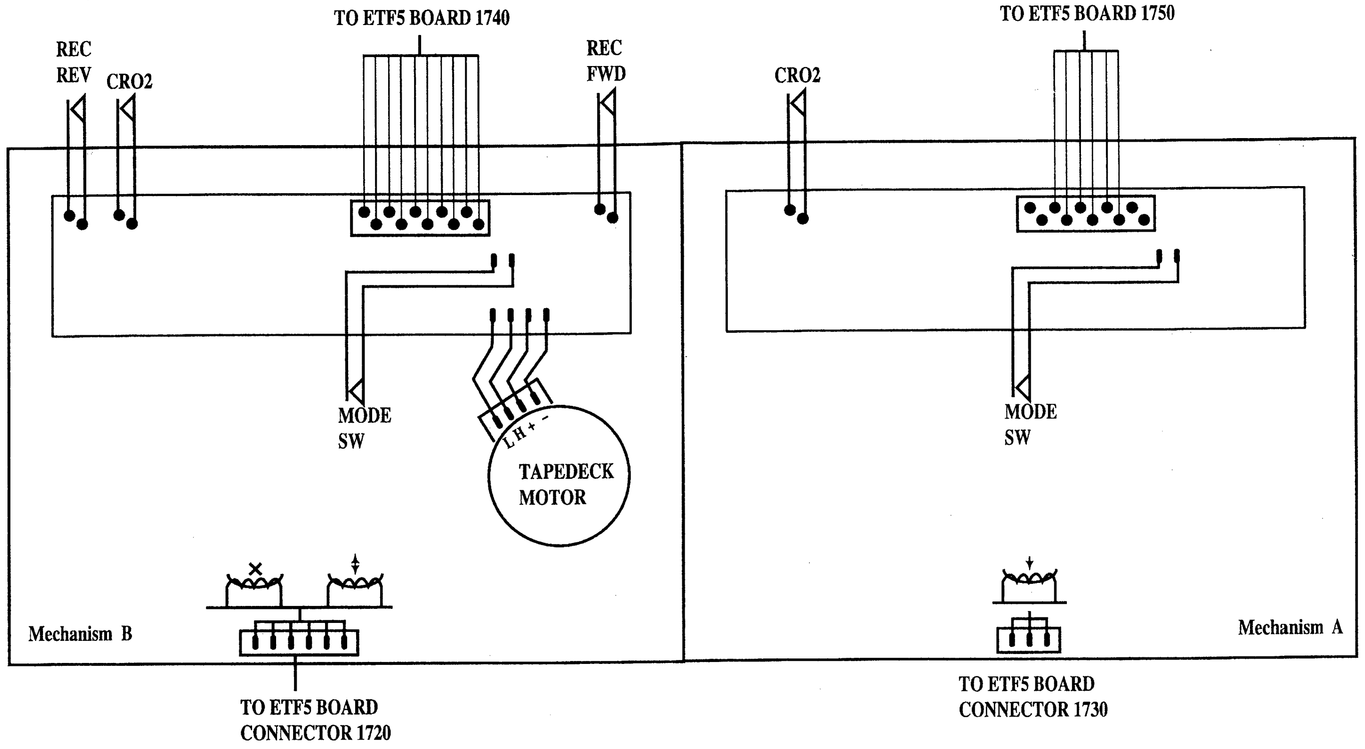
Electrical parts list.. 9-13

Tapedeck wiring (Double deck)



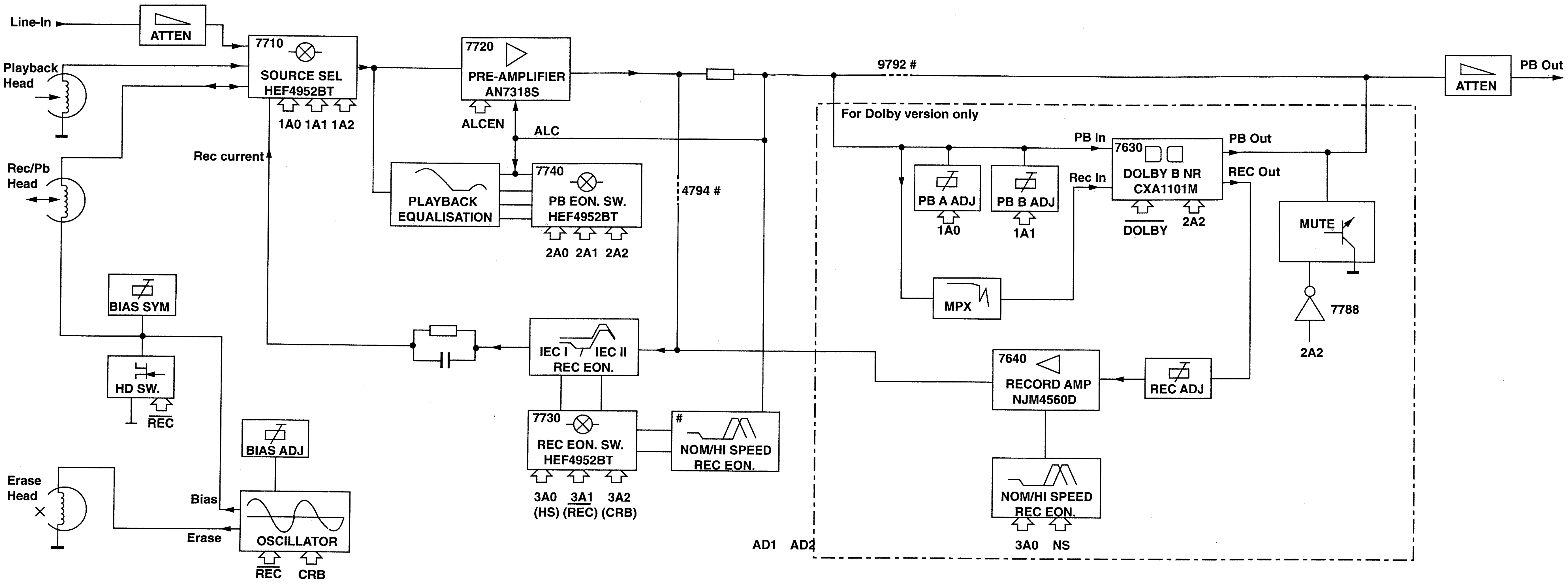
TO ETF5 BOARD 1740
REC REV
CRO2
REC FWD
MODE SW
TAPEDECK MOTOR
L H + -
Mechanism B
TO ETF5 BOARD CONNECTOR 1720
TO ETF5 BOARD 1750
CRO2
MODE SW
Mechanism A
TO ETF5 BOARD CONNECTOR 1730

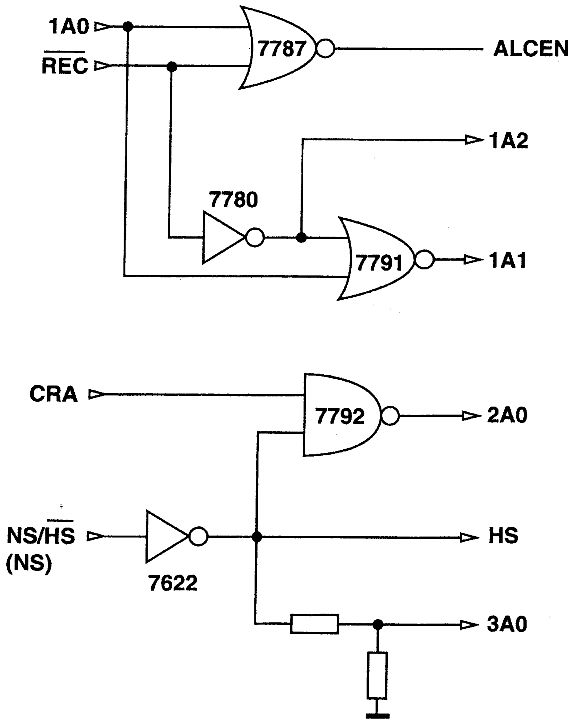
OPTIONS / VARIANTS TABLE

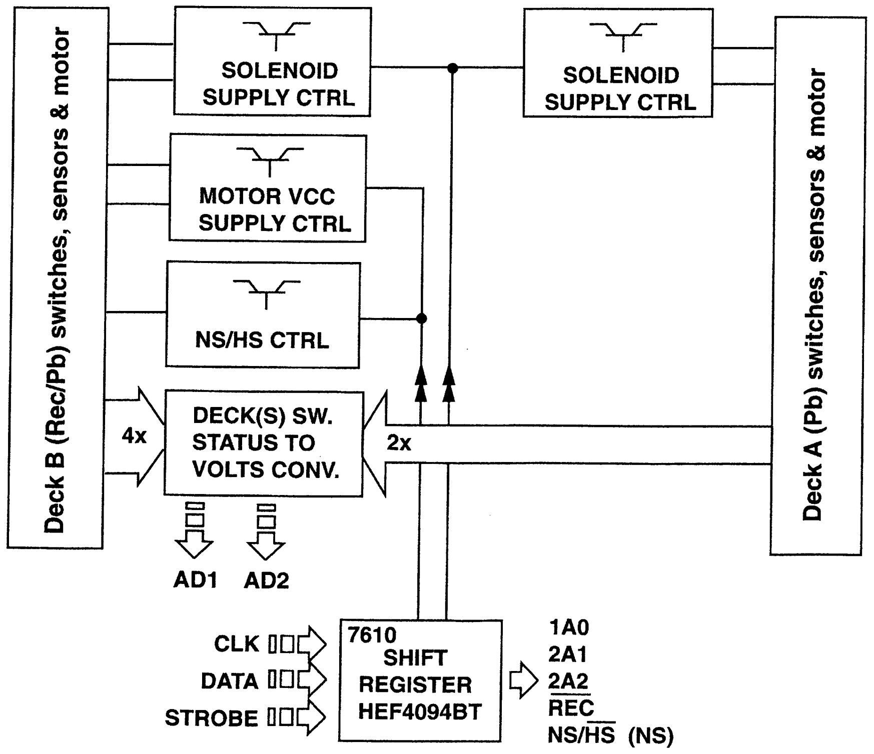
MODULE	ETF5				ETF6	
VARIANT	**1**	**2**	**3**	**4**	**5**	**6**
NAME	**DB/DD/FR**	**ND/DD/FR**	**ND/SD**	**ND/DD/FF**	**ND/DD/FR**	**ND/DD/FF**
Deck configuration	double	double	single	double	double	double
Autoreverse	yes (B)	yes (B)	yes	no	yes (B)	no
Auto-replay	no	no	no	yes (B)	no	yes (B)
Motor configuration	single	single	single	single	single	single
Auto tape type selection	yes	yes	yes	yes	yes	yes
Dolby B type Noise Reduction	yes	no	no	no	no	no
19 kHz pilot suppression	yes	no	no	no	no	no
High speed dubbing	yes	yes	no	yes	yes	yes

DB = Dolby B NR
DD = Double Deck
FF = Non-Autoreverse
FR = Autoreverse Deck B
ND = Non-Dolby
SD = Single Deck

BLOCK DIAGRAM


Line-In
ATTEN
7710
SOURCE SEL
HEF4952BT
1A0 1A1 1A2
Playback Head
Rec/Pb Head
Rec current
7720
PRE-AMPLIFIER
AN7318S
ALCEN
ALC
7740
PLAYBACK EQUALISATION
PB EON. SW.
HEF4952BT
2A0 2A1 2A2
4794 #
9792 #
ATTEN
PB Out
For Dolby version only
PB In
7630
DOLBY B NR
CXA1101M
PB Out
REC Out
Rec In
PB A ADJ
1A0
PB B ADJ
1A1
DOLBY
2A2
MUTE
7788
2A2
MPX
BIAS SYM
HD SW.
REC
IEC I
IEC II
REC EON.
7640
RECORD AMP
NJM4560D
REC ADJ
7730
REC EON. SW.
HEF4952BT
#
NOM/HI SPEED
REC EON.
3A0 3A1 3A2
(HS) (REC) (CRB)
BIAS ADJ
Erase Head
Bias
Erase
OSCILLATOR
REC CRB
AD1 AD2
NOM/HI SPEED
REC EON.
3A0 NS


1A0
REC
7787
ALCEN
1A2
7780
7791
1A1
CRA
7792
2A0
NS/HS
(NS)
HS
7622
3A0


Deck B (Rec/Pb) switches, sensors & motor
SOLENOID SUPPLY CTRL
SOLENOID SUPPLY CTRL
MOTOR VCC SUPPLY CTRL
NS/HS CTRL
4x
DECK(S) SW. STATUS TO VOLTS CONV.
2x
AD1
AD2
CLK
DATA
STROBE
7610
SHIFT REGISTER
HEF4094BT
1A0
2A1
2A2
REC
NS/HS (NS)
Deck A (Pb) switches, sensors & motor

NOTE: # For Non-dolby version only
Only 1 channel is presented.

▯▯⇨ MicroProcessor Control / Communication lines

⇨ Direct / Indirect Control lines from Shift Registers

Brief introduction

General

1. Playback Mode
   Signal from the playback head Deck A or Deck B is selected and fed through by the Mode Selector IC7710 (HEF4952B). The signal is amplified by amplifier IC7720 (AN7318S) before feeding to the IC7740 (HEF4952B) and then output to the AF Board through pins 5 and 6 of the connector 1701.

2. Recording Mode
   Recording Signal is selected and fed through by the Mode Selector IC7710 (HEF4952B) which is then amplified by the amplifier IC7720 (AN7318S). The amplified output signal will pass through IC7730 (HEF4952B) and then back to IC7710 (HEF4952B) before registered into the Rec/PB Head of Deck B.

3. Dubbing Mode
   In Dubbing mode, signal from the playback head Deck A is selected and fed through by the Mode Selector IC7710 (HEF4952B) which is then equalised for playback mode by the amplifier IC7720 (AN7318S) so that a flat response is obtained after the pre-amp. The equalised signal will then follow the same path as in the Recording mode.

4. Mode Selector
   The Mode Selector IC7710 (HEF4952B) caters for 4 inputs signal, namely Playback Signal from Deck A, Playback Signal from Deck B, Recording Signal and Dubbing Signal.

5. Amplifier PB/REC
   Amplifier IC7720 (AN7318S) is for the purpose of amplifying the Playback and Recording signal from the Mode Selector.

6. Automatic Level Control (ALC)
   ALC circuit consists of resistors (3765, 3766, 3767), capacitors (2762 , 2763) and control by transistor 7787 (BC847B). ALC limits the amplifier output to a constant value when input signal becomes too large, thus limiting recording current to below saturation level, to prevent recording distortion.

7. Muting Circuit (For Non-Dolby only)
   Switch S4 of the IC7740 (HEF4952B) is for the purpose of muting the output during Recording mode. During Recording mode, S4 is closed and shorted to the ground.

8. IC7740 (HEF4952B)
   The function of the IC7740 (HEF4952B) is to change time constant between 120us Ferro (IEC I) and 70us Chrome (IEC II) during playback mode. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II). This IC will switch to Flat Gain during the Recording mode.

9. IC7730 (HEF4952B)
   The function of the IC7730 (HEF4952B) is to change gain and time constant according to tape type and recording speed to boost recording current at higher frequency during recording to compensate for head loss. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II).

10. Bias Level
    Bias Level making use of the Variable resistor (3773) for adjusting the optimal level of the bias current for Ferro or Chrome.

11. Bias Symm (For Dolby only)
    Bias Symm making use of the Variable resistor (3785) to adjust the bias current for the left and the right channel to be equal.

12. PB Switch
    Playback Switch which consists of the FETs 7785 (For Dolby only) & 7786 (J111) is for the purpose of providing a virtual ground for the Rec/PB Head (Deck B) during Playback mode. During the Playback mode, the FETs are turn on and shorted pin 2 and 4 of connector 1720 to the ground. During Recording mode, the FETs are turn off to allow the oscillator signal to be superposition onto the Recording signal for recording.

13. Motor Speed
    During High speed dubbing, a feedback signal from the uP through pin 03 of the IC7610 (HEF4094BT) will trigger the transistors 7622 (BC847B) and 7616 (BC857B) to cause a change in the voltage level between High and Low, thus changing the speed of the motor.

14. IC7610 (HEF4094BT)
    IC7610 (HEF4094BT) is a Shift Register use for issues the logic for cmos switch ICs (HEF4952B) via 1A0, 2A1 and 2A2. IC7610(HEF4094BT) also issues logic to On/Off SOL_A, SOL_B and MOT. Recording speed is also controlled by IC7610(HEF4094BT) via NS/HS.

Dolby Circuit (For sets with Dolby B NR only)

15. IC7630 (CXA1101M)
    IC7630 (CXA1101M) in the Dolby circuit is a Dolby Noise Reduction Type B IC for the Playback and Recording signal. Noise Reduction ON/OFF are controlled by $\overline{\text{DOLBY}}$, which is from CLK, direct from uP. After clocking in DATA, CLK is set to HIGH/ LOW for NR OFF/ON.

16. 19kHz Filter
    The 19kHz filters 5631 & 5632 (LXD-210) in the Dolby circuit is for the purpose of filtering the 19kHz Pilot Tone (for Tuner signal only) of the Recording signal.

17. Level Adjust
    The Variable resistor 3635, 3636,3641 and 3642 in the Dolby circuit is for adjusting the playback level of the Dolby reference (400Hz , 200nWb/m). Transistor 7631, 7632 are ON to enable adjustment of 3641, 3642 during Playback Deck A. Transistor 7633, 7634 and 3635, 3636 are active for Playback Deck B.

18. Amplifier IC7640 (NJM4560M)
    The Amplifiers 7640A & 7640B (NJM4560M) in the Dolby circuit is for the purpose of amplified the Recording signal.

19. Muting Circuit
    The muting circuit which consists of transistors 7788, 7789 and 7790 (BC847B) is for the purpose of muting the output during Recording mode.

NOTATIONS & ABBREVIATIONS USED IN THIS DOCUMENT

CR	Chrome (IEC type II)
DB	Dolby NR type B
DD	Double Deck
DM	Double Motor
FE	Ferro (IEC type I)
FF	Non Auto Reverse
FR	Auto Reverse on Deck B
Gnd x	Ground x
HSD	High speed dubbing
ND	Non Dolby
NR	Noise Reduction
NSD	Normal speed dubbing
PB	Playback
REC	Record
S/A	Sub-assy
SD	Single Deck
SM	Single Motor

CONNECTORS ASSIGNMENTS:

CONNECTOR 1701			INTERCONNECTION TO AF5 BOARD
O	1	REC-R	Record input right
O	2	REC-L	Record input left
O	3	GND A	AF Ground
O	4	+12V	D.C. supply (+12V) in
O	5	TAPE-R	Playback output right
O	6	TAPE-L	Playback output left
O	7	-CMOS	Negative d.c. supply (-9V) for CMOS ICs

CONNECTOR 1703			INTERCONNECTION TO AF5 BOARD
O	1	GND M	Motor Ground
O	2	+MOTOR	D.C. supply (+12V) for tape deck motor & solenoid

CONNECTOR 1706			INTERCONNECTION TO FRONT BOARD
O	1	AD2	Deck sensing switches output voltage / Deck A EOT
O	2	AD1	Deck sensing switches output voltage / Deck B EOT
O	3	+5	DC supply +5V for ADC network
O	4	GND P	Control & Oscillator Ground
O	5	CLK	HEF4094BT shift register Clock line
O	6	DATA	HEF4094BT shift register Data line
O	7	STROBE	HEF4094BT shift register Strobe line

CONNECTOR 1710			DECK B HEADS CONNECTON ***(For ETF6 only)***
O	1	B R/P HD L+	R/P Head left channel positive
O	2	B R/P HD R-	R/P Head right channel positive
O	3	CMN	R/P Head return ground
O	4	ERASE HEAD	Erase Head
O	5	GND A	Erase Head ground

CONNECTOR 1720			DECK B HEADS CONNECTON ***(For ETF5 only)***
O	1	B R/P HD L+	R/P Head left channel positive
O	2	B R/P HD L-	R/P Head left channel negative
O	3	B R/P HD R+	R/P Head right channel positive
O	4	B R/P HD R-	R/P Head right channel negative
O	5	ERASE HEAD	Erase Head
O	6	GND A	Erase Head ground

CONNECTOR 1730			DECK A HEAD CONNECTIONS ***(For Double Deck versions only)***
O	1	A PB HD R+	Pb Head right channel positive
O	2	GND A	Pb Head return ground shield
O	3	A PB HD L+	Pb Head left channel positive

CONNECTOR 1740			DECK B CONTROL INTERFACE ***(For ETF5 Double Deck only)***	
O	1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
O	2	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
O	3	CrO2	Chrome tape detection switch	[open=Cr: close=Fe]
O	4	PHOTO B	Photo sensor output (tape movement indication)	
O	5	SOL B	Solenoid supply	
O	6	Vcc	Deck / Motor supply	
O	7	MODE	Mode switch (head engagement)	[open=off: close=engaged]
O	8	GND M	Deck / Motor ground	
O	9	H	H pin for motor	
O	10	L	L pin for motor	

CONNECTOR 1750			DECK A CONTROL INTERFAC ***(For ETF5 Double Deck only)***	
O	1	CrO2	Chrome tape detection switch	[open=Cr: close=Fe]
O	2	PHOTO A	Photo sensor output (tape movement indication)	
O	3	SOL A	Solenoid supply	
O	4	Vcc	Deck/Motor supply	
O	5	MODE	Mode switch (head engagement)	[open=off: close=engaged]
O	6	GND M	Deck/Motor ground	

CONNECTOR 1760			DECK B CONTROL INTERFACE ***(For ETF5 Single Deck only)***	
O	1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
O	2	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
O	3	CrO2	Chrome tape detection switch	[open=Cr: close=Fe]
O	4	PHOTO B	Photo sensor output (tape movement indication)	
O	5	SOL B	Solenoid supply	
O	6	Vcc	Deck / Motor supply	
O	7	MODE	Mode switch (head engagement)	[open=off: close=engaged]
O	8	GND M	Deck / Motor ground	

CONNECTOR 1770			DECK B CONTROL INTERFACE ***(For ETF6 only)***	
O	1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
O	2	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
O	3	CrO2 B	Chrome tape detection switch deck B	[open=Cr: close=Fe]
O	4	PHOTO B	Photo sensor output (tape movement indication)	
O	5	SOL B	Solenoid supply for deck B	
O	6	Vcc	Deck / Motor supply	
O	7	MODE B	Mode switch (head engagement)	[open=off: close=engaged]
O	8	GND M	Deck / Motor ground	
O	9	L	L pin for motor	
O	10	H	H pin for motor	
O	11	CrO2 A	Chrome tape detection switch deck A	[open=Cr: close=Fe]
O	12	SOL A	Solenoid supply for deck A	
O	13	PHOTO A	Photo sensor output (tape movement indication)	

TAPE MECHANISM A ELECTRONICS

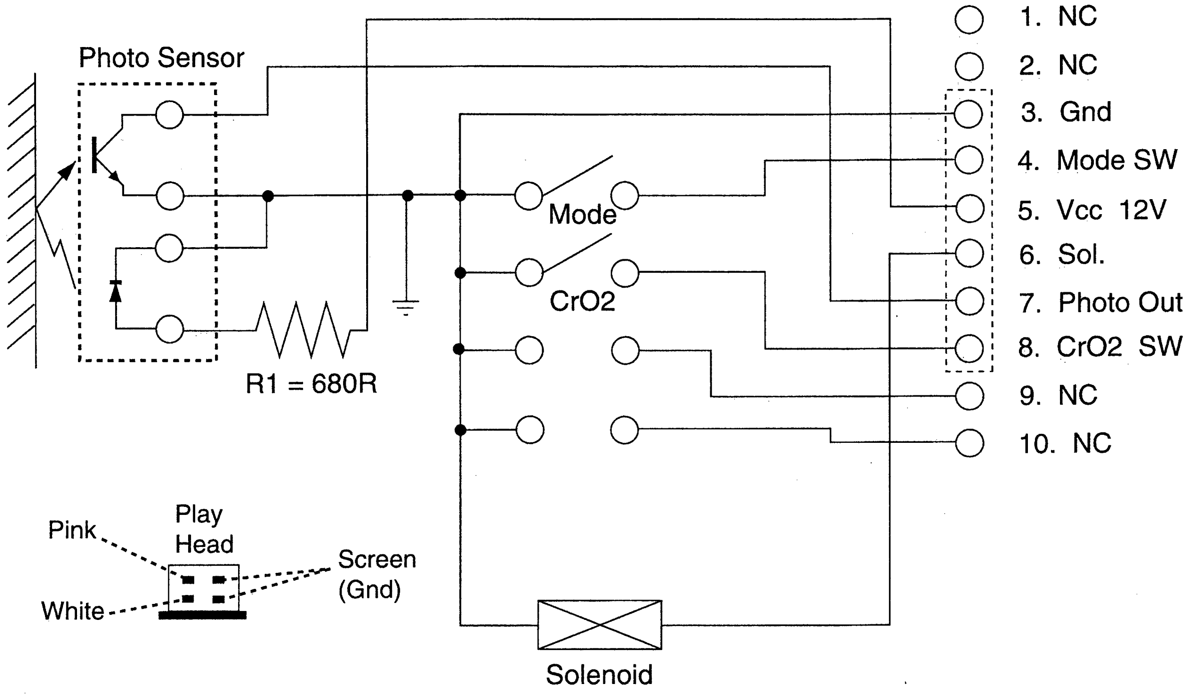
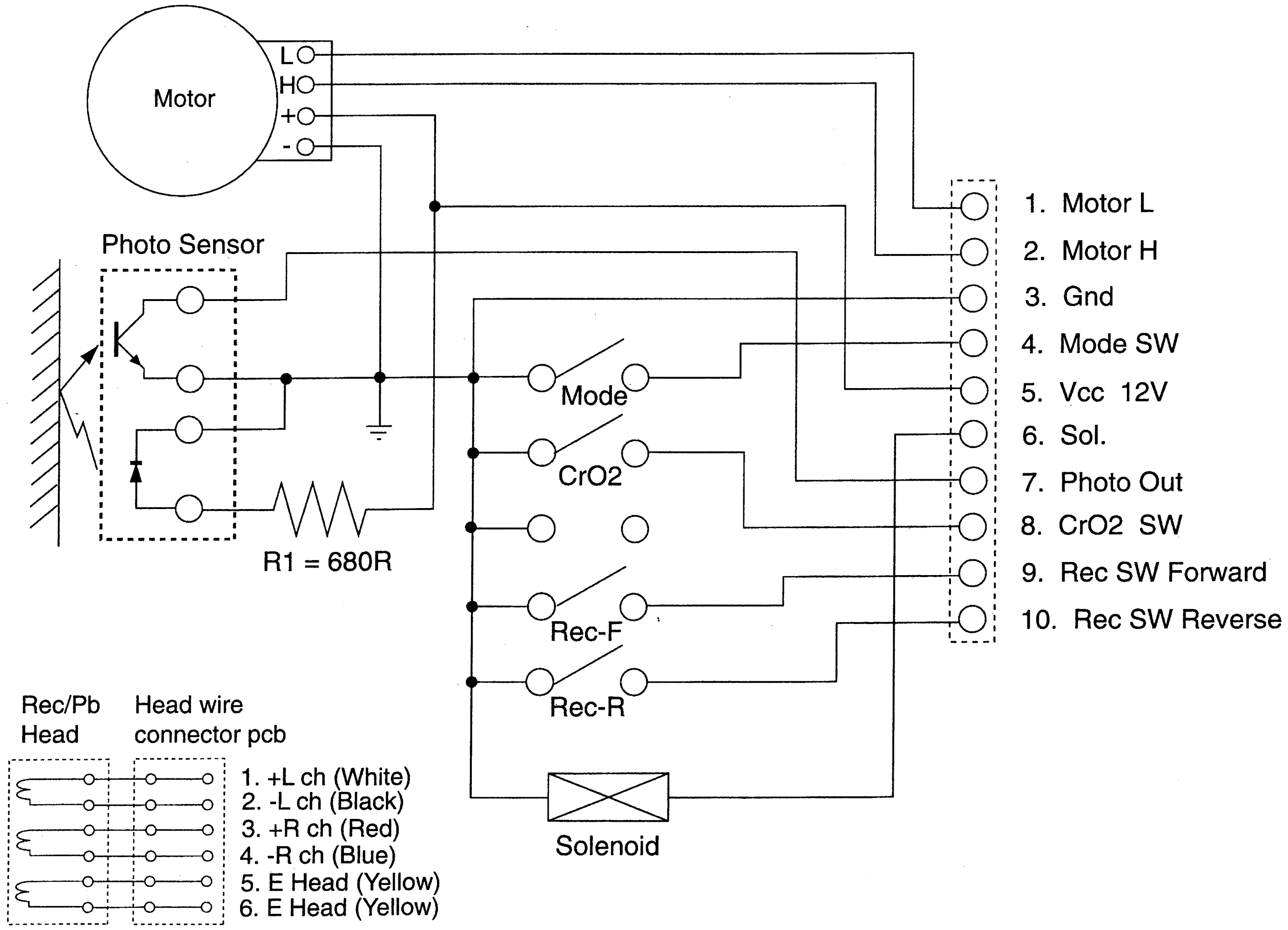


Photo Sensor
R1 = 680R
Mode
CrO2
1. NC
2. NC
3. Gnd
4. Mode SW
5. Vcc 12V
6. Sol.
7. Photo Out
8. CrO2 SW
9. NC
10. NC
Pink
Play Head
White
Screen (Gnd)
Solenoid

TAPE MECHANISM B ELECTRONICS


Motor
L
H
+
-
Photo Sensor
R1 = 680R
Mode
CrO2
Rec-F
Rec-R
Solenoid
1. Motor L
2. Motor H
3. Gnd
4. Mode SW
5. Vcc 12V
6. Sol.
7. Photo Out
8. CrO2 SW
9. Rec SW Forward
10. Rec SW Reverse
Rec/Pb Head
Head wire connector pcb
1. +L ch (White)
2. -L ch (Black)
3. +R ch (Red)
4. -R ch (Blue)
5. E Head (Yellow)
6. E Head (Yellow)

General

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST	
					with	to
ADJUST MOTOR SPEED						
HIGH SPEED	SBC420 (4822 397 30071) 3150Hz	DUBBING	◇1 or ◇2 LEFT RIGHT	frequency counter	3622 *	5040Hz ± 0.5%
NORMAL SPEED		PLAY B			3620	3150Hz ± 0.5%
		PLAY A			check	3150Hz -0.8/+1.8%
CHECK WOW & FLUTTER						
DECK A & B	SBC420 (4822 397 30071) 3150Hz	PLAY	◇1 or ◇2 LEFT RIGHT	W&F-meter	check only	≤0.4 % DIN or ≤0.35 % CCIR *
ADJUST AZIMUTH						
DECK A & B	SBC420 (4822 397 30071) 10kHz	PLAY FWD	◇1 or ◇2 LEFT RIGHT	mV-meter	left hand screw	max. output level & left=right
		PLAY REV #			right hand screw	

Playback

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST	
					with	to
*ADJUST DOLBY PLAYBACK LEVEL **						
DECK A	TCC-130 (4822 397 30269) 200nWb/m	PLAY	◇7 or ◇8 LEFT RIGHT	mV-meter	3641(L), 3642(R)	548mV ±0.5dB
DECK B		PLAY FWD			3635(L), 3636(R)	
		PLAY REV #			Check	548mV ±1dB
CHECK PLAYBACK FREQUENCY RESPONSE						
PB. FREQ. RESP.	SBC420 (4822 397 30071)	PLAY	◇1 or ◇2 LEFT RIGHT	mV-meter	Check	limits see fig.1

* For Dolby version only
# For Auto-reverse version only

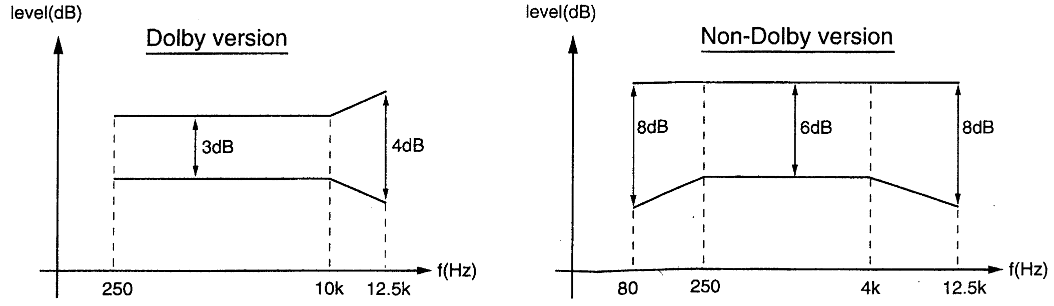


figure. 1

Rec

PRE

DECI

CHE

Inject
100H
10kH
via <

Inject
via <

Rem

ADJ

Inject
via <

Rema

* For

General

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST	
					with	to
ADJUST MOTOR SPEED						
HIGH SPEED	SBC420 (4822 397 30071) 3150Hz	DUBBING	◇1 or ◇2 LEFT RIGHT	frequency counter	3622 *	5040Hz ± 0.5%
NORMAL SPEED		PLAY B			3620	3150Hz ± 0.5%
		PLAY A			check	3150Hz -0.8/+1.8%
CHECK WOW & FLUTTER						
DECK A & B	SBC420 (4822 397 30071) 3150Hz	PLAY	◇1 or ◇2 LEFT RIGHT	W&F-meter	check only	≤0.4 % DIN or ≤0.35 % CCIR *
ADJUST AZIMUTH						
DECK A & B	SBC420 (4822 397 30071) 10kHz	PLAY FWD	◇1 or ◇2 LEFT RIGHT	mV-meter	left hand screw	max. output level & left=right
		PLAY REV #			right hand screw	

Playback

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST	
					with	to
ADJUST DOLBY PLAYBACK LEVEL *						
DECK A	TCC-130 (4822 397 30269) 200nWb/m	PLAY	◇7 or ◇8 LEFT RIGHT	mV-meter	3641(L), 3642(R)	548mV ±0.5dB
DECK B		PLAY FWD			3635(L), 3636(R)	
		PLAY REV #			Check	548mV ±1dB
CHECK PLAYBACK FREQUENCY RESPONSE						
PB. FREQ. RESP.	SBC420 (4822 397 30071)	PLAY	◇1 or ◇2 LEFT RIGHT	mV-meter	Check	limits see fig.1

* For Dolby version only

# For Auto-reverse version only

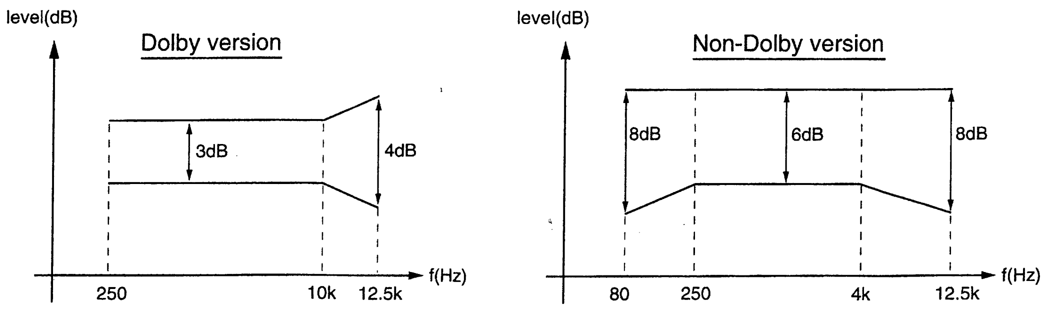


figure. 1

H

SW

2V

Out

SW

V Forward

SW Reverse

Recording

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST	
					with	to
PRE-ADJUST BIAS AND BIAS-SYMMETRY						
DECK B	CrO_2	RECORD	◇5 or ◇6 LEFT RIGHT	mV-meter	3773	995mV
					3785 *	left = right
	FERRO				check only	750mV ± 1.5dB
CHECK OVERALL FREQUENCY RESPONSE AND DISTORTION						
Inject 3mV signals 100Hz, 250Hz, 1kHz, 10kHz, 12.5kHz via ◇3 or ◇4	CrO_2	RECORD				
	RECORDED CASSETTE	PLAY	◇1 or ◇2 LEFT RIGHT	mV-meter	check only	limits see fig.2
Inject 1kHz 8.85mV via ◇3 or ◇4	CrO_2	RECORD				
	RECORDED CASSETTE	PLAY	◇1 or ◇2 LEFT RIGHT	THD-meter	check only	≤3%
Remark: If high frequencies are not within limits, decrease bias and re-measure. If distortion is too high increase bias and re-measure.						
ADJUST DOLBY RECORD LEVEL *						
Inject 400Hz 8.85mV via ◇3 or ◇4	CrO_2	RECORD	◇9 or ◇10 LEFT RIGHT	mV-meter	3655 & 3556	420mV
	RECORDED CASSETTE	PLAY	◇7 or ◇8 LEFT RIGHT	mV-meter	check	170mV ± 1dB
Remark: If measured value is out, re-adjust record level up or down slightly to attain play level.						

* For Dolby version only

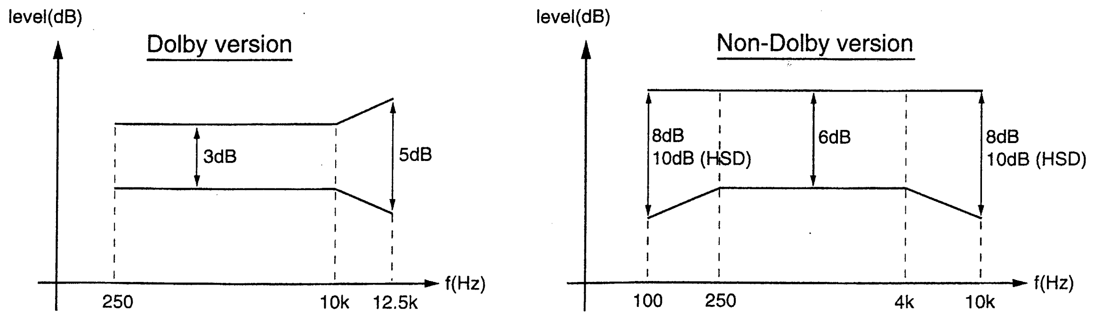
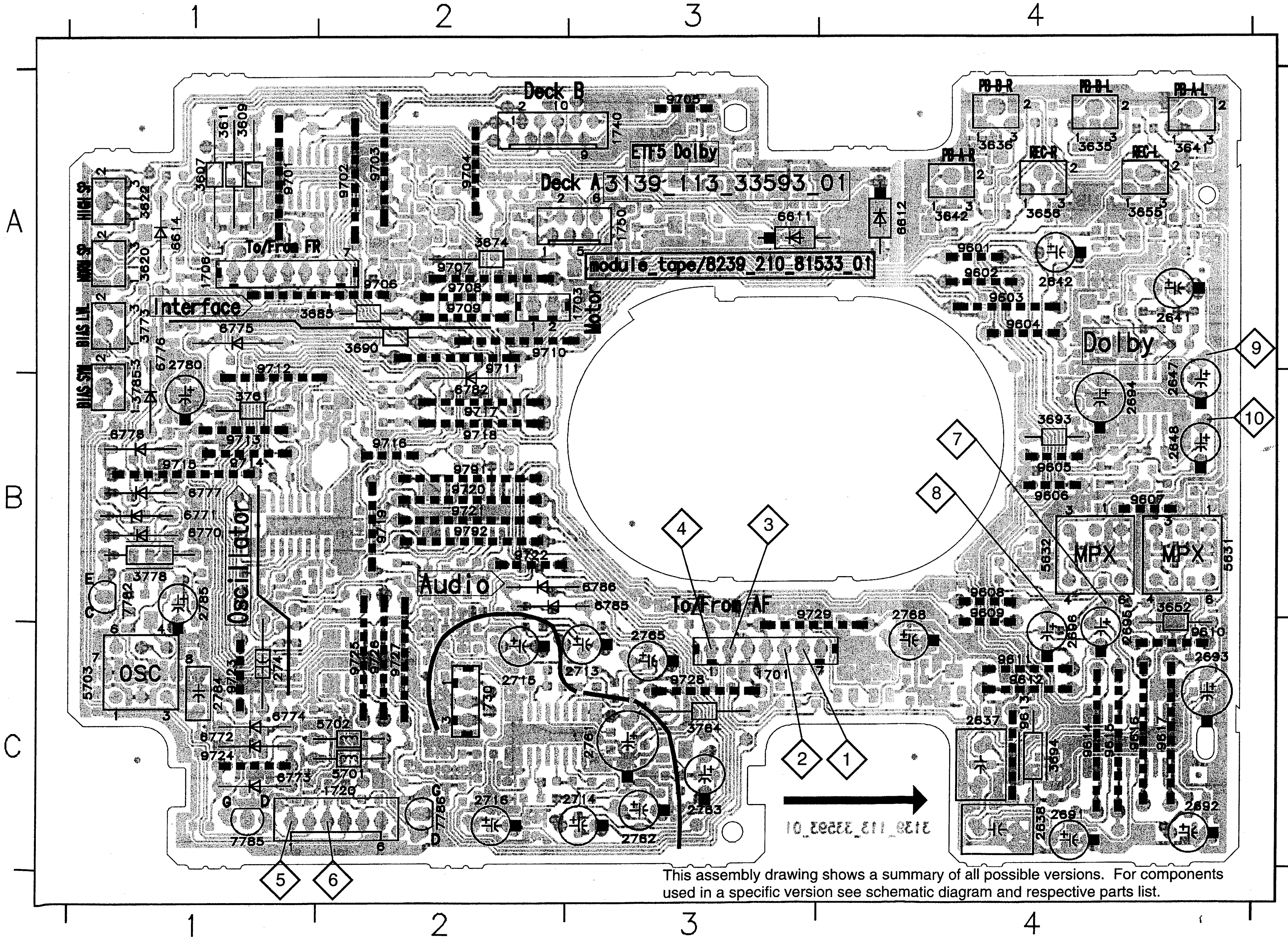


figure. 2

COMPONENT LAYOUT

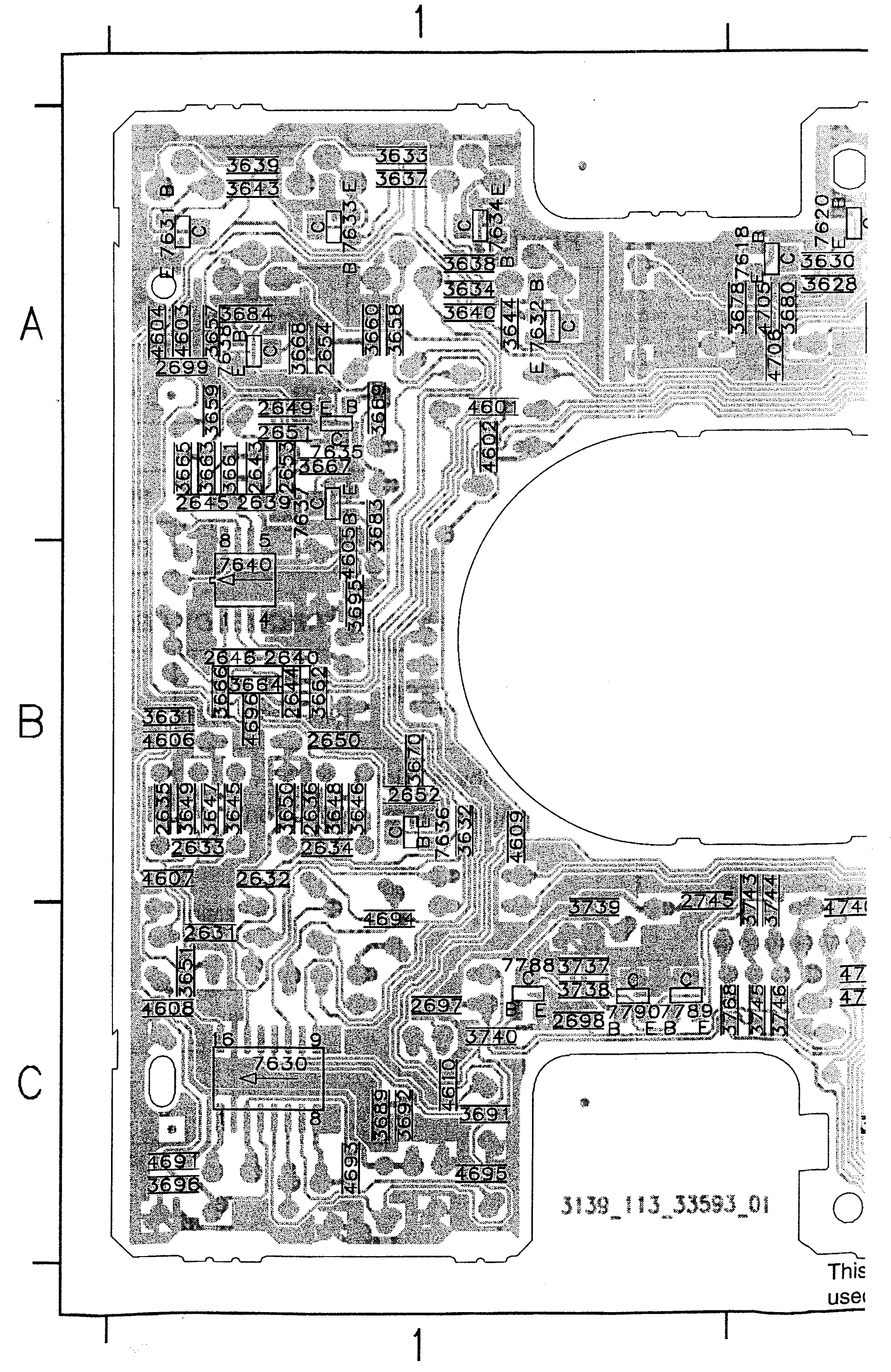
1701	C3	2642	A4	2714	C3	2784	C1	3642	A4	3764	C3	6612	A4	6778	B1	9604	A4	9614	C4	9707	A2	9717	B2	9727	C2
1703	A3	2647	B4	2715	C2	2785	B1	3652	B4	3773	A1	6614	A1	6782	B2	9605	B4	9615	C4	9708	A2	9718	B2	9728	C3
1706	A1	2648	B4	2716	C2	3607	A1	3655	A4	3778	B1	6770	B1	6785	B3	9606	B4	9616	C4	9709	A2	9719	B2	9729	B3
1720	C2	2691	C4	2741	C1	3609	A1	3656	A4	3785	B1	6771	B1	6786	B3	9607	B4	9617	C4	9710	A2	9720	B2	9791	B2
1730	C2	2692	C4	2761	C3	3611	A1	3674	A2	5631	B4	6772	C1	7782	B1	9608	B4	9701	A1	9711	A2	9721	B2	9792	B2
1740	A3	2693	C4	2762	C3	3620	A1	3685	A1	5632	B4	6773	C1	7785	C1	9609	B4	9702	A2	9712	A1	9722	B2		
1750	A3	2694	B4	2763	C3	3622	A1	3690	A2	5701	C2	6774	C1	7786	C2	9610	C4	9703	A2	9713	B1	9723	C1		
2637	C4	2695	C4	2765	C3	3635	A4	3693	B4	5702	C2	6775	A1	9601	A4	9611	C4	9704	A2	9714	B1	9724	C1		
2638	C4	2696	C4	2768	B4	3636	A4	3694	C4	5703	C1	6776	A1	9602	A4	9612	C4	9705	A3	9715	B1	9725	C2		
2641	A4	2713	C3	2780	A1	3641	A4	3761	B1	6611	A3	6777	B1	9603	A4	9613	C4	9706	A2	9716	B2	9726	C2		


1
2
3
4
A
B
C
Deck B
Deck A 3139_113_33593_01
ETF5 Dolby
module_tape/8239_210_81533_01
To/From FR
Interface
Motor
Dolby
MPX
MPX
Oscillator
OSC
Audio
To/From AF
PB-B-R
PB-B-L
PB-A-L
PB-A-R
REC-R
REC-L
HIGH-SW
MAIN-SW
BIAS LIM
BIAS SW
3139_113_33593_01
1
2
3
4
5
6
7
8
9
10

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

CHIP LAYOUT

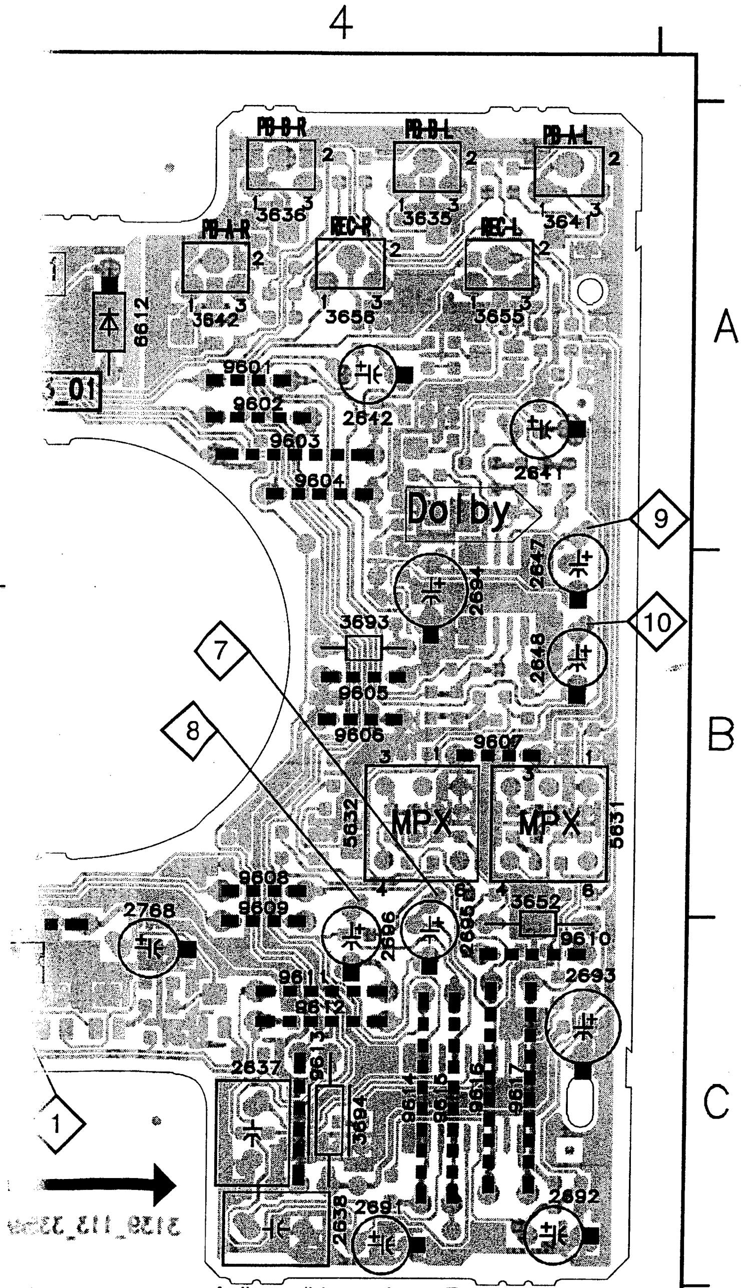
2621	A3	2698	C1	2727	C4	3605	A3	3644	A1	3678	A
2622	A4	2699	A1	2728	B3	3606	A3	3645	B1	3679	A
2623	A4	2701	C4	2729	B3	3608	A4	3646	B1	3680	A
2624	A3	2702	C3	2730	B3	3610	A4	3647	B1	3683	A
2625	A4	2703	C3	2733	C2	3612	A4	3648	B1	3684	A
2631	C1	2704	C3	2734	C2	3613	A3	3649	B1	3686	A
2632	B1	2705	C3	2735	C3	3614	A4	3650	B1	3689	C
2633	B1	2706	C3	2737	C2	3616	A4	3651	C1	3691	C
2634	B1	2707	C3	2738	C2	3618	A4	3657	A1	3692	C
2635	B1	2708	C3	2742	B4	3623	A2	3658	A1	3695	B
2636	B1	2709	C3	2743	C4	3624	A2	3659	A1	3696	C
2639	A1	2710	C3	2744	B3	3625	A2	3660	A1	3701	C
2640	B1	2711	C2	2745	C1	3626	A2	3661	A1	3702	C
2643	A1	2712	C2	2760	B4	3628	A2	3662	B1	3703	C
2644	B1	2717	B3	2769	B2	3630	A2	3663	A1	3704	C
2645	A1	2718	C4	2770	B2	3631	B1	3664	B1	3705	C
2646	B1	2719	B4	2781	C4	3632	B1	3665	A1	3706	C
2649	A1	2720	B4	2782	B4	3633	A1	3666	B1	3707	C
2650	B1	2721	B3	2786	C4	3634	A1	3667	A1	3708	C
2651	A1	2722	B3	2787	C4	3637	A1	3668	A1	3709	C
2652	B1	2723	B3	3601	A3	3638	A1	3669	A1	3710	C
2653	A1	2724	B4	3602	A3	3639	A1	3670	B1	3711	C
2654	A1	2725	B4	3603	A3	3640	A1	3672	A4	3712	C
2697	C1	2726	B4	3604	A3	3643	A1	3676	A3	3713	C


1
A
B
C
3139_113_33593_01
7630
7640

This
used

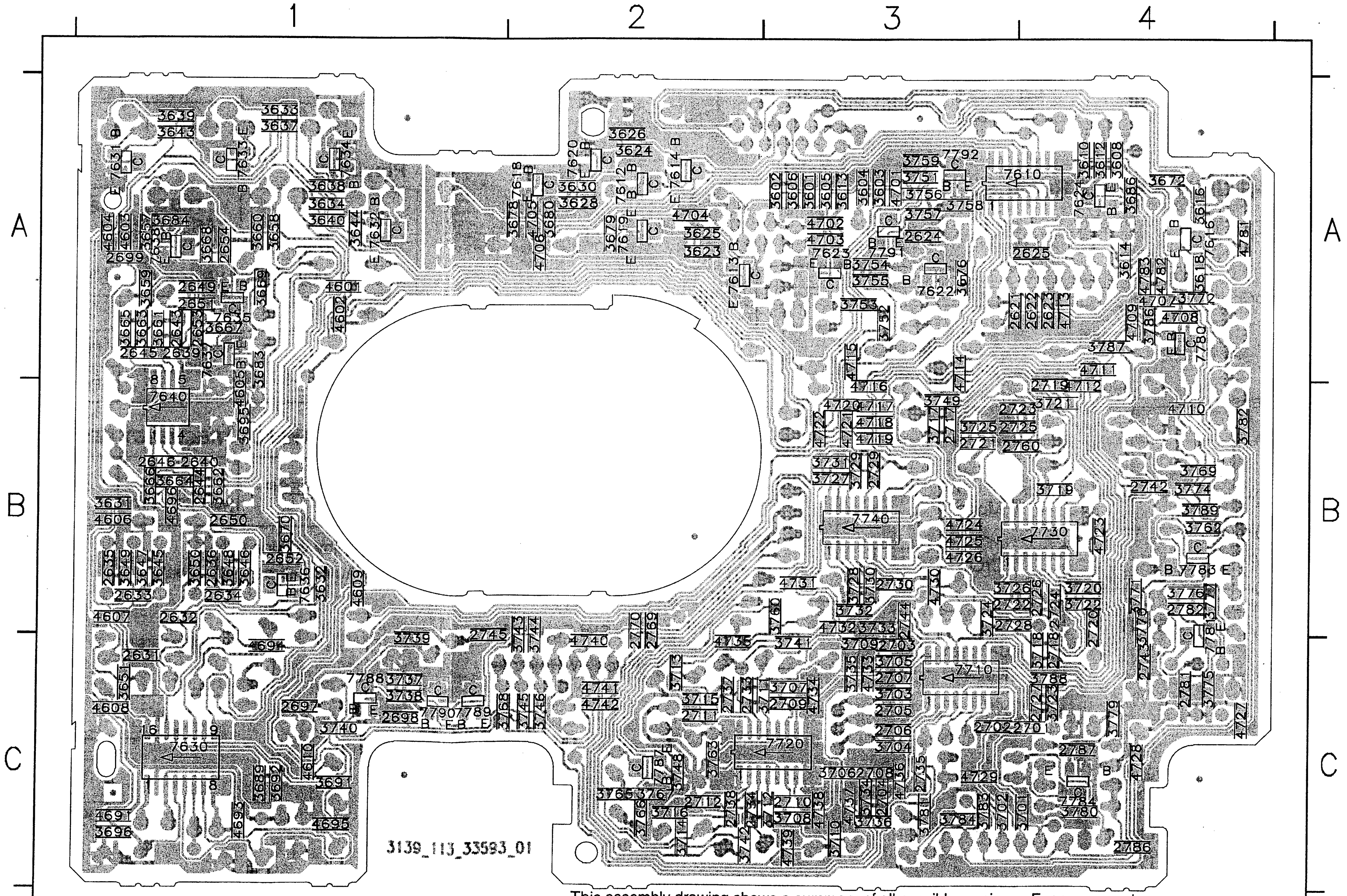
CHIP LAYOUT

604	A4	9614	C4	9707	A2	9717	B2	9727	C2
605	B4	9615	C4	9708	A2	9718	B2	9728	C3
606	B4	9616	C4	9709	A2	9719	B2	9729	B3
607	B4	9617	C4	9710	A2	9720	B2	9791	B2
608	B4	9701	A1	9711	A2	9721	B2	9792	B2
609	B4	9702	A2	9712	A1	9722	B2		
9610	C4	9703	A2	9713	B1	9723	C1		
611	C4	9704	A2	9714	B1	9724	C1		
12	C4	9705	A3	9715	B1	9725	C2		
13	C4	9706	A2	9716	B2	9726	C2		



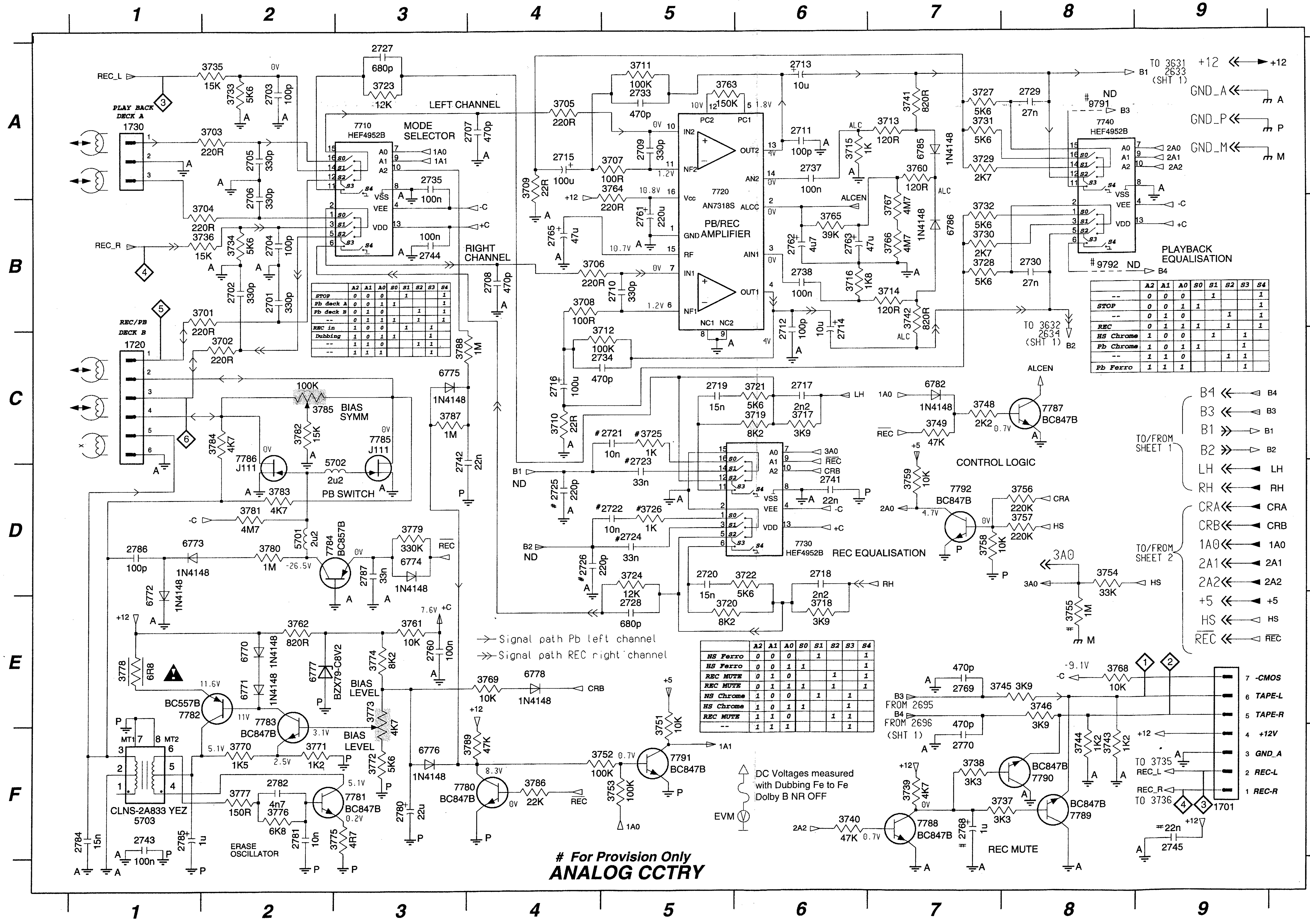
…ows a summary of all possible versions. For components
… see schematic diagram and respective parts list.

2621	A3	2698	C1	2727	C4	3605	A3	3644	A1	3678	A2	3714	C2	3738	C1	3766	C2	4604	A1	4713	A4	4737	C3	7634	A1
2622	A4	2699	A1	2728	B3	3606	A3	3645	B1	3679	A2	3715	C2	3739	C1	3767	C2	4605	B1	4714	A3	4738	C3	7635	A1
2623	A4	2701	C4	2729	B3	3608	A4	3646	B1	3680	A2	3716	C2	3740	C1	3768	C2	4606	B1	4715	A3	4739	C3	7636	B1
2624	A3	2702	C3	2730	B3	3610	A4	3647	B1	3683	A1	3717	B3	3741	C3	3769	B4	4607	B1	4716	B3	4740	C2	7637	A1
2625	A4	2703	C3	2733	C2	3612	A4	3648	B1	3684	A1	3718	C4	3742	C2	3770	B4	4608	C1	4717	B3	4741	C2	7638	A1
2631	C1	2704	C3	2734	C2	3613	A3	3649	B1	3686	A4	3719	B4	3743	C2	3771	B4	4609	B1	4718	B3	4742	C2	7640	B1
2632	B1	2705	C3	2735	C3	3614	A4	3650	B1	3689	C1	3720	B4	3744	C2	3772	A4	4610	C1	4719	B3	4781	A4	7710	C3
2633	B1	2706	C3	2737	C2	3616	A4	3651	C1	3691	C1	3721	B4	3745	C2	3774	B4	4691	C1	4720	B3	4782	A4	7720	C3
2634	B1	2707	C3	2738	C2	3618	A4	3657	A1	3692	C1	3722	B4	3746	C2	3775	C4	4693	C1	4721	B3	4783	A4	7730	B4
2635	B1	2708	C3	2742	B4	3623	A2	3658	A1	3695	B1	3723	C4	3748	C2	3776	B4	4694	C1	4722	B3	7610	A4	7740	B3
2636	B1	2709	C3	2743	C4	3624	A2	3659	A1	3696	C1	3724	B3	3749	B3	3777	B4	4695	C1	4723	B4	7612	A2	7780	A4
2639	A1	2710	C3	2744	B3	3625	A2	3660	A1	3701	C4	3725	B3	3751	A3	3779	C4	4696	B1	4724	B3	7613	A2	7781	B4
2640	B1	2711	C2	2745	C1	3626	A2	3661	A1	3702	C3	3726	B3	3752	A3	3780	C4	4701	A3	4725	B3	7614	A2	7783	B4
2643	A1	2712	C2	2760	B4	3628	A2	3662	B1	3703	C3	3727	B3	3753	A3	3781	C3	4702	A3	4726	B3	7616	A4	7784	C4
2644	B1	2717	B3	2769	B2	3630	A2	3663	A1	3704	C3	3728	B3	3754	A3	3782	B4	4703	A3	4727	C4	7618	A2	7787	C2
2645	A1	2718	C4	2770	B2	3631	B1	3664	B1	3705	C3	3729	B3	3755	A3	3783	C3	4704	A2	4728	C4	7619	A2	7788	C1
2646	B1	2719	B4	2781	C4	3632	B1	3665	A1	3706	C3	3730	B3	3756	A3	3784	C3	4705	A2	4729	C3	7620	A2	7789	C1
2649	A1	2720	B4	2782	B4	3633	A1	3666	B1	3707	C3	3731	B3	3757	A3	3786	A4	4706	A2	4730	B3	7622	A3	7790	C1
2650	B1	2721	B3	2786	C4	3634	A1	3667	A1	3708	C3	3732	B3	3758	A3	3787	A4	4707	A4	4731	B3	7623	A3	7791	A3
2651	A1	2722	B3	2787	C4	3637	A1	3668	A1	3709	C3	3733	B3	3759	A3	3788	C4	4708	A4	4732	B3	7624	A4	7792	A3
2652	B1	2723	B3	3601	A3	3638	A1	3669	A1	3710	C3	3734	C3	3760	B3	3789	B4	4709	A4	4733	C3	7630	C1		
2653	A1	2724	B4	3602	A3	3639	A1	3670	B1	3711	C3	3735	C3	3762	B4	4601	A1	4710	B4	4734	C3	7631	A1		
2654	A1	2725	B4	3603	A3	3640	A1	3672	A4	3712	C3	3736	C3	3763	C2	4602	A1	4711	A4	4735	C2	7632	A1		
2697	C1	2726	B4	3604	A3	3643	A1	3676	A3	3713	C2	3737	C1	3765	C2	4603	A1	4712	B4	4736	C3	7633	A1		



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

ANALOG CIRCUIT


1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
REC_L
REC_R
PLAY BACK DECK A
1730
REC/PB DECK B
1720
LEFT CHANNEL
RIGHT CHANNEL
7710
HEF4952B
MODE SELECTOR
7720
AN7318S
PB/REC AMPLIFIER
7740
HEF4952B
PLAYBACK EQUALISATION
7730
HEF4952B
REC EQUALISATION
CONTROL LOGIC
BIAS SYMM
PB SWITCH
BIAS LEVEL
ERASE OSCILLATOR
REC MUTE
CLNS-2A833 YEZ
5703
7782 BC557B
7783 BC847B
7781 BC847B
7784 BC857B
7785 J111
7786 J111
7780 BC847B
7787 BC847B
7788 BC847B
7789 BC847B
7790 BC847B
7791 BC847B
7792 BC847B
BZX79-C8V2
1N4148
TO 3631 2633 (SHT 1)
TO 3632 2634 (SHT 1)
+12
+12V
GND_A
GND_P
GND_M
TO/FROM SHEET 1
TO/FROM SHEET 2
B4
B3
B1
B2
LH
RH
CRA
CRB
1A0
2A1
2A2
+5
HS
REC
3A0
ALCEN
FROM 2695
FROM 2696 (SHT 1)
TO 3735
TO 3736
1701
7 -CMOS
6 TAPE-L
5 TAPE-R
4 +12V
3 GND_A
2 REC-L
1 REC-R
EVM
#9791 ND
#9792 ND
B1 ND
B2 ND

-≻ Signal path Pb left channel
-≫ Signal path REC right channel

DC Voltages measured with Dubbing Fe to Fe Dolby B NR OFF

For Provision Only

ANALOG CCTRY

MODE SELECTOR

	A2	A1	A0	S0	S1	S2	S3	S4
STOP	0	0	0		1			1
Pb deck A	0	0	1	1				1
Pb deck B	0	1	0			1		1
--	0	1	1	1		1		1
REC in	1	0	0		1		1	
Dubbing	1	0	1	1			1	
--	1	1	0			1	1	
--	1	1	1				1	

PLAYBACK EQUALISATION

	A2	A1	A0	S0	S1	S2	S3	S4
--	0	0	0		1			1
STOP	0	0	1	1				1
--	0	1	0			1		1
REC	0	1	1	1		1		1
HS Chrome	1	0	0		1		1	
Pb Chrome	1	0	1	1			1	
--	1	1	0			1	1	
Pb Ferro	1	1	1				1	

REC EQUALISATION

	A2	A1	A0	S0	S1	S2	S3	S4
NS Ferro	0	0	0		1			1
HS Ferro	0	0	1	1				1
REC MUTE	0	1	0			1		1
REC MUTE	0	1	1	1		1		1
NS Chrome	1	0	0		1		1	
HS Chrome	1	0	1	1			1	
REC MUTE	1	1	0			1	1	
--	1	1	1				1	

1701	*F9*
1720	*C1*
1730	*A1*
2701	*B2*
2702	*B2*
2703	*A2*
2704	*B2*
2705	*A2*
2706	*A2*
2707	*A4*
2708	*B4*
2709	*A5*
2710	*B5*
2711	*A6*
2712	*B6*
2713	*A6*
2714	*C6*
2715	*A4*
2716	*C4*
2717	*C6*
2718	*D6*
2719	*C5*
2720	*D5*
2721	*C5*
2722	*D5*
2723	*D5*
2724	*D5*
2725	*D4*
2726	*D4*
2727	*A3*
2728	*E5*
2729	*A8*
2730	*B8*
2733	*A5*
2734	*C4*
2735	*A3*
2737	*A6*
2738	*B6*
2741	*D6*
2742	*C3*
2743	*F1*
2744	*B3*
2745	*F9*
2760	*E3*
2761	*B5*
2762	*B6*
2763	*B6*
2765	*B4*
2768	*F7*
2769	*E7*
2770	*F7*
2780	*F3*
2781	*F2*
2782	*F2*
2784	*F1*
2785	*F1*
2786	*D1*
2787	*D3*
3701	*B2*
3702	*C2*
3703	*A2*
3704	*B2*
3705	*A4*
3706	*B4*
3707	*A5*
3708	*B4*
3709	*A4*
3710	*C4*
3711	*A5*
3712	*C5*
3713	*A7*
3714	*B7*
3715	*A6*
3716	*B6*
3717	*C6*
3718	*E6*
3719	*C6*
3720	*E5*
3721	*C6*
3722	*D6*
3723	*A3*
3724	*D5*
3725	*C5*
3726	*D5*
3727	*A7*
3728	*B7*
3729	*A7*
3730	*B7*
3731	*A7*
3732	*B7*
3733	*A2*
3734	*B2*
3735	*A2*
3736	*B2*
3737	*F8*
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3740	*F6*
3741	*A7*
3742	*B7*
3743	*F8*
3744	*F8*
3745	*E7*
3746	*E8*
3748	*C7*
3749	*C7*
3751	*E5*
3752	*F5*
3753	*F5*
3754	*D8*
3755	*E8*
3756	*D8*
3757	*D8*
3758	*D7*
3759	*D7*
3760	*A7*
3761	*E3*
3762	*E2*
3763	*A5*
3764	*A5*
3765	*B6*
3766	*B7*
3767	*B7*
3768	*E8*
3769	*E4*
3770	*F2*
3771	*F2*
3772	*F3*
3773	*E3*
3774	*E3*
3775	*F3*
3776	*F2*
3777	*F2*
3778	*E1*
3779	*D3*
3780	*D2*
3781	*D2*
3782	*C2*
3783	*D2*
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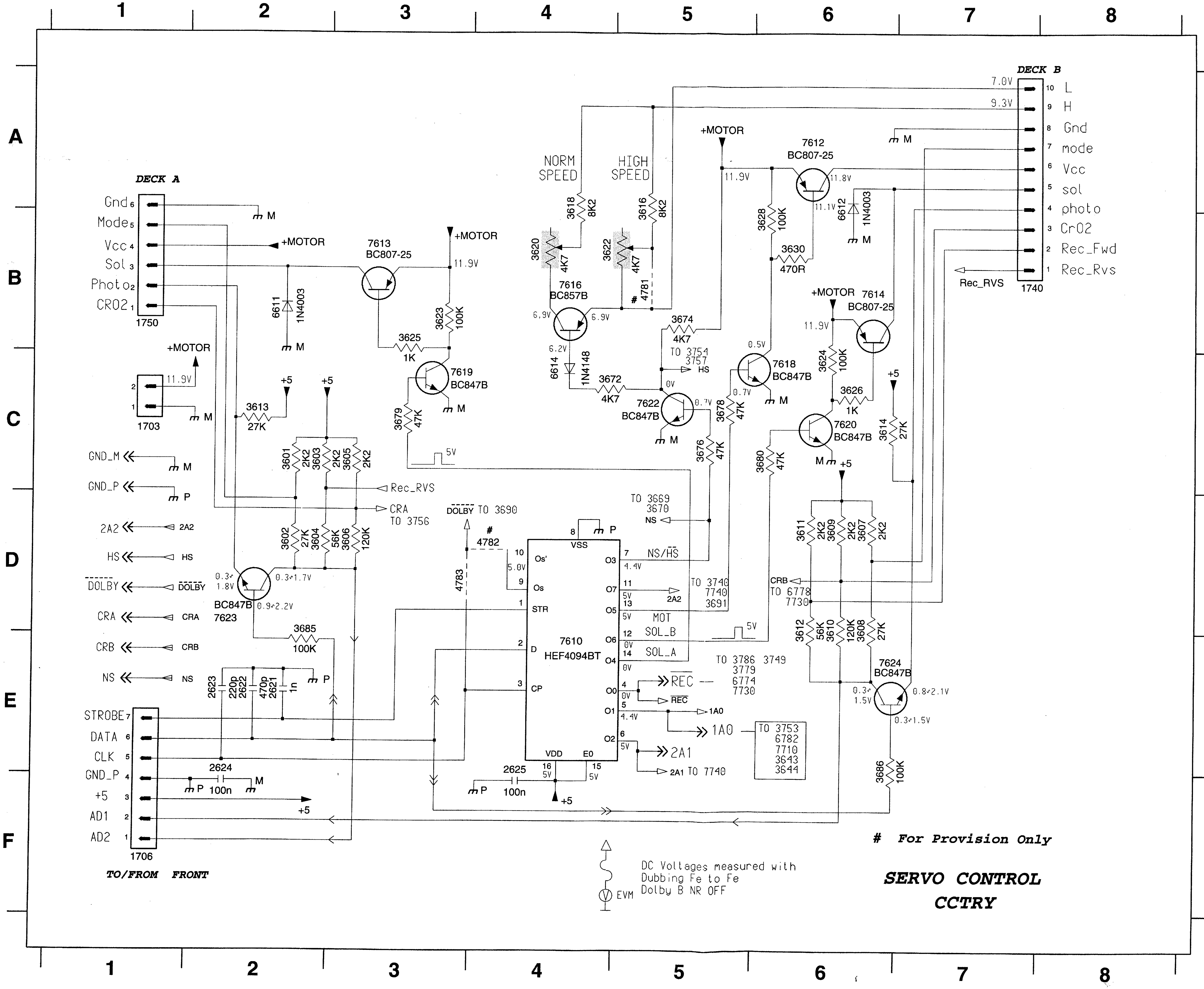
3786	*F4*
3787	*C3*
3788	*C3*
3789	*F4*
5701	*D2*
5702	*D2*
5703	*F1*
6770	*E2*
6771	*E2*
6772	*E1*
6773	*D1*
6774	*D3*
6775	*C3*
6776	*F3*
6777	*E2*
6778	E4
6782	C7
6785	A7
6786	B7
7710	A3
7720	A5
7730	D6
7740	A8
7780	F4
7781	F3
7782	E1
7783	E2
7784	D2
7785	C3
7786	D2
7787	C8
7788	F7
7789	F8
7790	F8
7791	F5
7792	D7
9791	A8
9792	B8

SERVO CONTROL CIRCUIT


DECK A
Gnd 6
Mode 5
Vcc 4
Sol 3
Photo 2
CR02 1
1750
M
+MOTOR
6611
1N4003
7613
BC807-25
11.9V
3623
100K
3625
1K
7619
BC847B
3679
47K
5V
1703
11.9V
3613
27K
+5
3601 2K2
3603 2K2
3605 2K2
Rec_RVS
CRA
TO 3756
3602 27K
3604 56K
3606 120K
BC847B
7623
0.3-1.8V
0.3-1.7V
0.9-2.2V
3685
100K
GND_M
GND_P
P
2A2
HS
DOLBY
CRA
CRB
NS
2623
220p 2622
470p 2621
1n
STROBE 7
DATA 6
CLK 5
GND_P 4
+5 3
AD1 2
AD2 1
1706
2624
100n
TO/FROM FRONT
NORM SPEED
HIGH SPEED
3618 8K2
3616 8K2
3620 4K7
3622 4K7
# 4781
7616
BC857B
6.9V
6.2V
6614
1N4148
3672
4K7
3674
4K7
TO 3754 3757
HS
7622
BC847B
0V
0.7V
3676 47K
3678 47K
DOLBY TO 3690
# 4782
4783
TO 3669 3670
NS
7610
HEF4094BT
VSS
Os'
Os
STR
D
CP
VDD
E0
O3
O7
O5
O6
O4
O0
O1
O2
NS/HS
2A2
MOT
SOL_B
SOL_A
TO 3740 7740 3691
TO 3786 3749 3779 6774 7730
REC
1A0
TO 3753 6782 7710 3643 3644
2A1
2A1 TO 7740
2625
100n
DECK B
L 10
H 9
Gnd 8
mode 7
Vcc 6
sol 5
photo 4
CrO2 3
Rec_Fwd 2
Rec_Rvs 1
1740
7.0V
9.3V
7612
BC807-25
11.8V
11.1V
3628 100K
3630 470R
6612 1N4003
7614
BC807-25
3624 100K
3626 1K
7618
BC847B
0.5V
7620
BC847B
3680 47K
3614 27K
3611 2K2
3609 2K2
3607 2K2
CRB
TO 6778 7730
3612 56K
3610 120K
3608 27K
7624
BC847B
0.3-1.5V
0.8-2.1V
3686 100K
EVM
1 2 3 4 5 6 7 8
A B C D E F

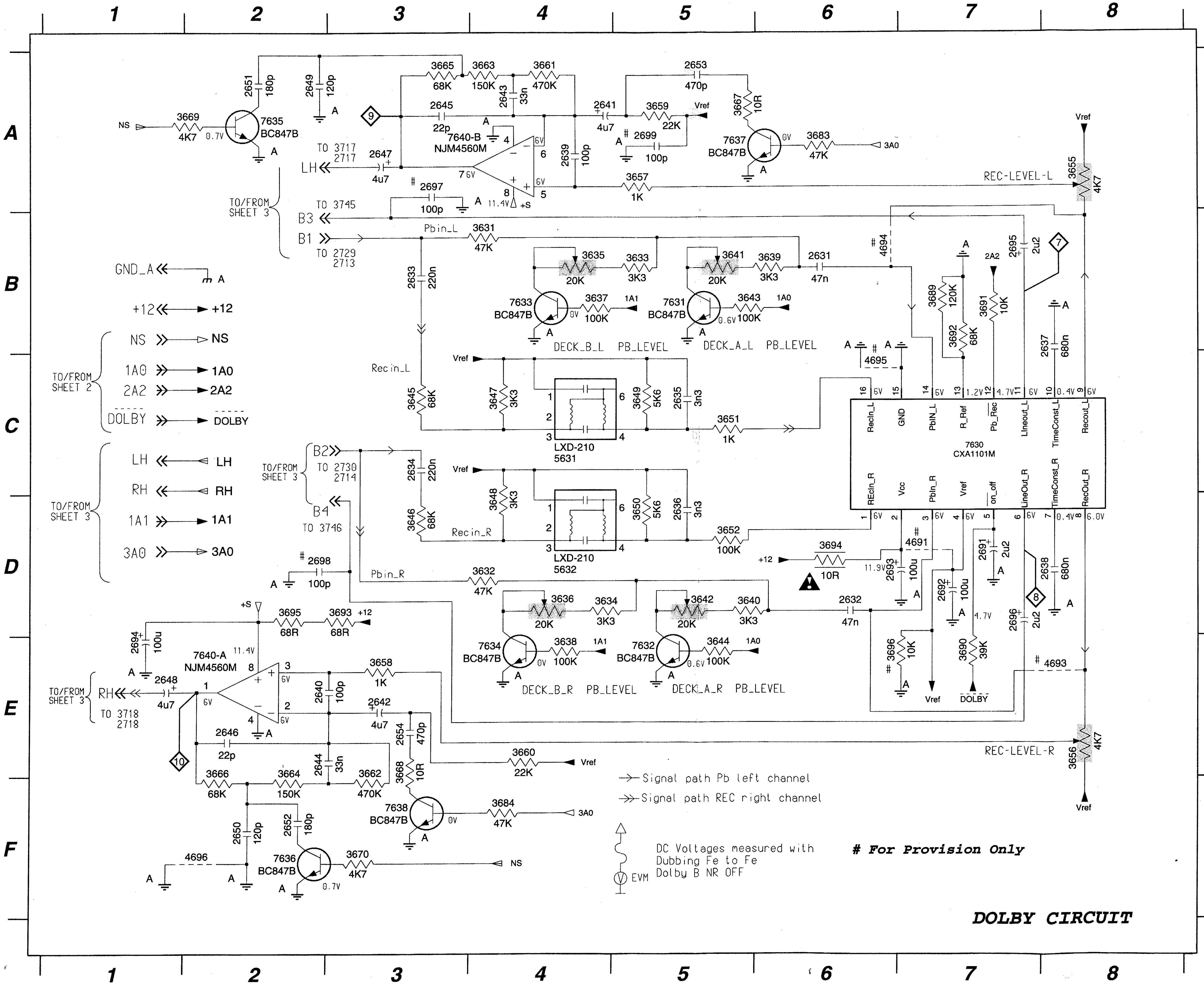
For Provision Only

DC Voltages measured with
Dubbing Fe to Fe
Dolby B NR OFF

SERVO CONTROL CCTRY

1703	C1
1706	F1
1740	B8
1750	B1
2621	E2
2622	E2
2623	E2
2624	E2
2625	E4
3601	C2
3602	D2
3603	C2
3604	D2
3605	C3
3606	D3
3607	D6
3608	D6
3609	D6
3610	D6
3611	D6
3612	D6
3613	C2
3614	C6
3616	A5
3618	A4
3620	B4
3622	B4
3623	B3
3624	C6
3625	B3
3626	C6
3628	B6
3630	B6
3672	C4
3674	B5
3676	C5
3678	C5
3679	C3
3680	C6
3685	E2
3686	E6
4781	B5
4782	D4
4783	D3
6611	B2
6612	A6
6614	C4
7610	E4
7612	A6
7613	B3
7614	B6
7616	B4
7618	C6
7619	C3
7620	C6
7622	C5
7623	D2
7624	E6

DOLBY CIRCUIT *(For Dolby sets only)*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2
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A
B
C
D
E
F
NS
3669
4K7
0.7V
7635
BC847B
2651
180p
2649
120p
3665
68K
3663
150K
3661
470K
2643
33n
2645
22p
9
7640-B
NJM4560M
TO 3717
2717
LH
2647
4u7
2697
100p
11.4V
+S
2639
100p
2641
4u7
2653
470p
3659
22K
Vref
2699
100p
3667
10R
7637
BC847B
3683
47K
3A0
3657
1K
REC-LEVEL-L
3655
4K7
TO/FROM SHEET 3
TO 3745
B3
B1
TO 2729
2713
Pbin_L
3631
47K
3635
20K
3633
3K3
3641
20K
3639
3K3
2631
47n
4694
2695
2u2
7
2A2
2633
220n
7633
BC847B
3637
100K
1A1
7631
BC847B
3643
100K
1A0
DECK_B_L PB_LEVEL
DECK_A_L PB_LEVEL
3689
120K
3691
10K
3692
68K
2637
680n
4695
GND_A
+12
NS
TO/FROM SHEET 2
1A0
2A2
DOLBY
Recin_L
3645
68K
3647
3K3
LXD-210
5631
3649
5K6
2635
3n3
3651
1K
Recin_L
GND
PbIN_L
R_Ref
Pb_Rec
Lineout_L
TimeConst_L
Recout_L
7630
CXA1101M
RecIn_R
Vcc
PbIn_R
Vref
on_off
LineOut_R
TimeConst_R
RecOut_R
LH
RH
1A1
3A0
TO/FROM SHEET 3
B2
TO 2730
2714
B4
TO 3746
2634
220n
3648
3K3
3646
68K
Recin_R
LXD-210
5632
3650
5K6
2636
3n3
3652
100K
3694
10R
+12
2693
100u
4691
2691
2u2
2638
680n
8
2698
100p
Pbin_R
3632
47K
3636
20K
3634
3K3
3642
20K
3640
3K3
2632
47n
2692
100u
2696
2u2
7634
BC847B
3638
100K
7632
BC847B
3644
100K
DECK_B_R PB_LEVEL
DECK_A_R PB_LEVEL
3696
10K
3690
39K
4693
DOLBY
3695
68R
3693
68R
2694
100u
7640-A
NJM4560M
TO/FROM SHEET 3
RH
2648
4u7
TO 3718
2718
3658
1K
2640
100p
2642
4u7
2654
470p
10
2646
22p
2644
33n
3660
22K
REC-LEVEL-R
3656
4K7
3666
68K
3664
150K
3662
470K
3668
10R
7638
BC847B
3684
47K
2650
120p
2652
180p
7636
BC847B
3670
4K7
4696
EVM
DOLBY CIRCUIT

→ Signal path Pb left channel

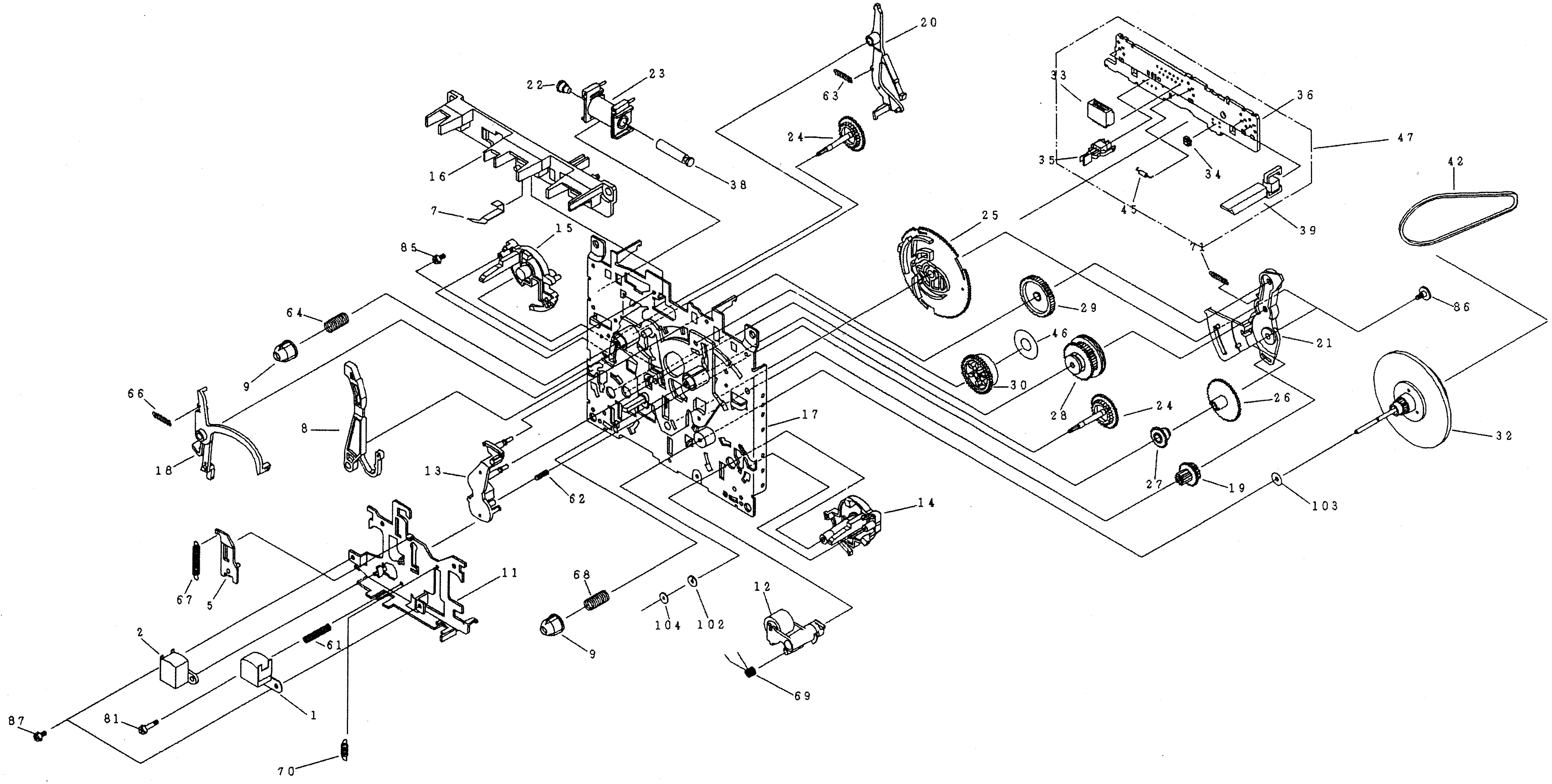
↠ Signal path REC right channel

DC Voltages measured with
Dubbing Fe to Fe
Dolby B NR OFF

# For Provision Only

2631	B6
2632	D6
2633	B3
2634	C3
2635	C5
2636	D5
2637	B8
2638	D8
2639	A4
2640	E2
2641	A4
2642	E3
2643	A4
2644	E2
2645	A3
2646	E2
2647	A3
2648	E1
2649	A2
2650	F2
2651	A2
2652	F2
2653	A5
2654	E3
2691	D7
2692	D7
2693	D6
2694	E1
2695	B7
2696	D7
2697	A3
2698	D2
2699	A5
3631	B4
3632	D4
3633	B5
3634	D4
3635	B4
3636	D4
3637	B4
3638	E4
3639	B6
3640	D5
3641	B5
3642	D5
3643	B5
3644	E5
3645	C3
3646	D3
3647	C4
3648	D4
3649	C5
3650	D5
3651	C5
3652	D5
3655	A8
3656	E8
3657	A5
3658	E3
3659	A5
3660	E4
3661	A4
3662	E3
3663	A4
3664	E2
3665	A3
3666	E2
3667	A5
3668	E3
3669	A2
3670	F3
3683	A6
3684	F4
3689	B7
3690	E7
3691	B7
3692	B7
3693	D3
3694	D6
3695	D2
3696	E6
4691	D7
4693	E8
4694	B6
4695	C6
4696	F2
5631	C4
5632	D4
7630	C7
7631	B5
7632	E5
7633	B4
7634	E4
7635	A2
7636	F2
7637	A5
7638	F3
7640-A	E2
7640-B	A4

TAPE MECHANISM A - PLAY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103
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81
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70

MECHANICAL PARTS - PLAY MECHANISM

1	4822 249 10397	MS15RAA2N1
2	4822 249 30146	Dummy Head
12	4822 528 10974	Assembly Arm Pinch R
23	4822 281 11069	Solenoid
32	4822 528 11209	Assembly Flywheel RV
33	4822 265 11207	Connector Socket 6 pin
34	4822 130 10205	Photo Sensor
35	4822 276 13946	Mode Switch
39	4822 278 90613	Leaf Switch
42	4822 358 10168	Belt AF 40mm
45	4822 050 16801	680R 1% 0,4w
69	4822 492 11542	Spring
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer

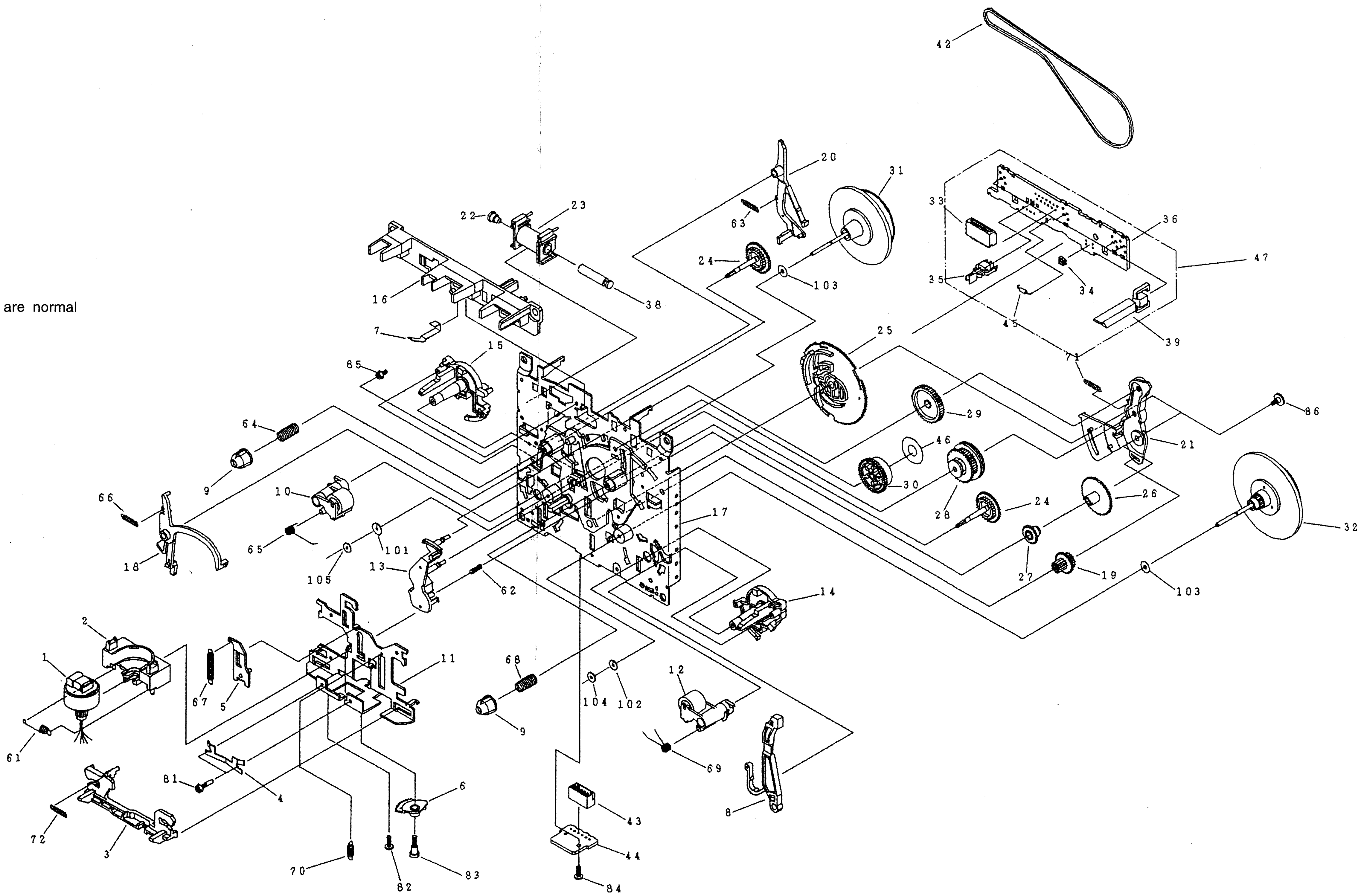
Note: Only the parts mentioned in this list are normal service spare parts.

TAPE MECHANISM B - RECORD/PLAYBACK

MECHANICAL PARTS - PLAY MECHANISM

1	4822 249 10526	Record/Playback Head
10	4822 528 10975	Assembly Arm Pinch L
12	4822 528 10974	Assembly Arm Pinch R
23	4822 281 11069	Solenoid
31	4822 528 11211	Assembly Flywheel LV
32	4822 528 11209	Assembly Flywheei RV
33	4822 265 11208	Connector Socket 10 pin
34	4822 130 10205	Photo Sensor
35	4822 276 13946	Mode Switch
39	4822 278 90613	Leaf Switch
42	4822 358 10169	Belt
45	4822 050 16801	680R 1% 0,4w
65	4822 492 11546	Spring
69	4822 492 11542	Spring
101	4822 532 12934	Washer
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer
105	4822 532 12935	Washer

Note: Only the parts mentioned in this list are normal service spare parts.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101
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105
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103
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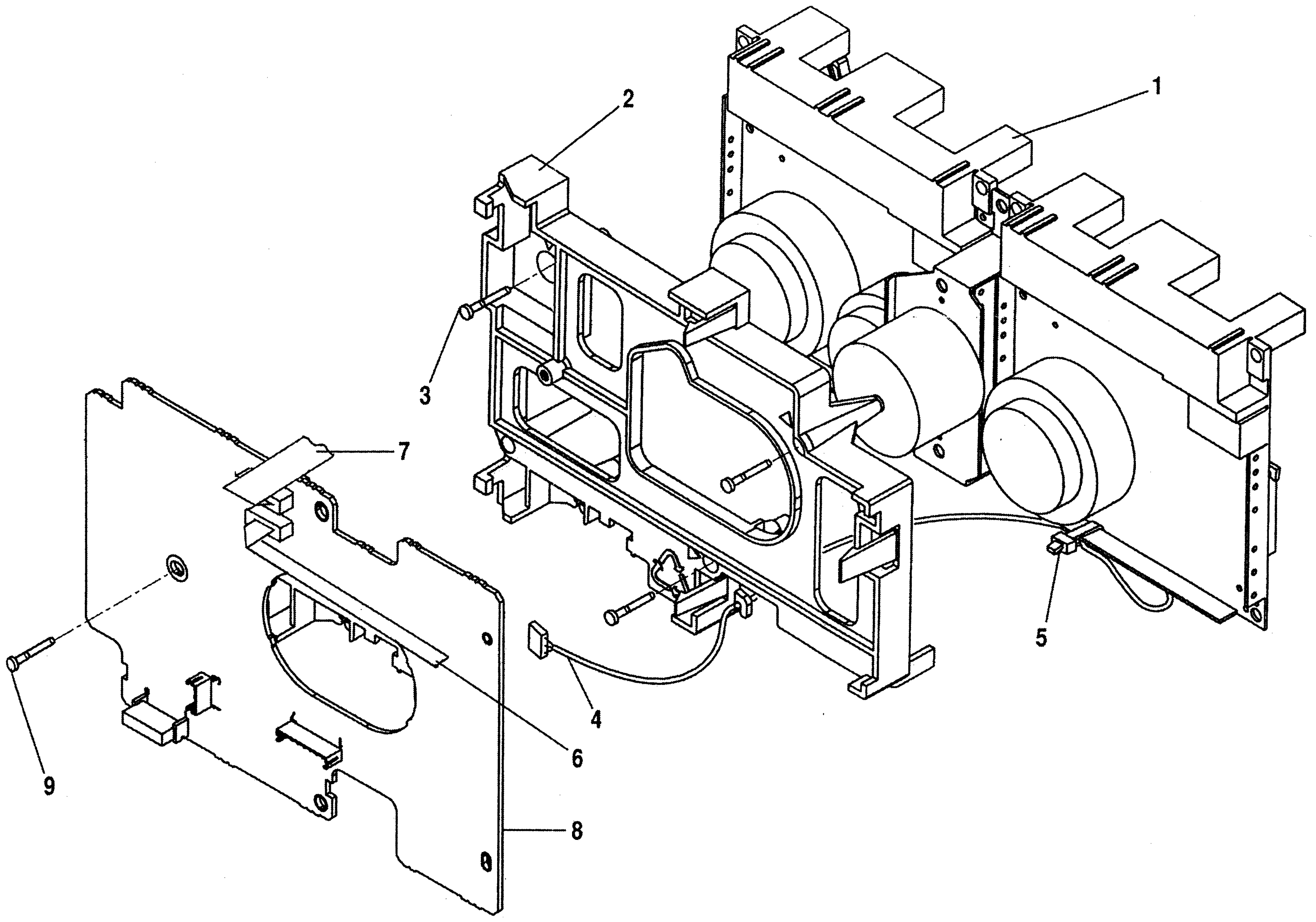


ETF5 TAPE MODULE EXPLODED VIEW

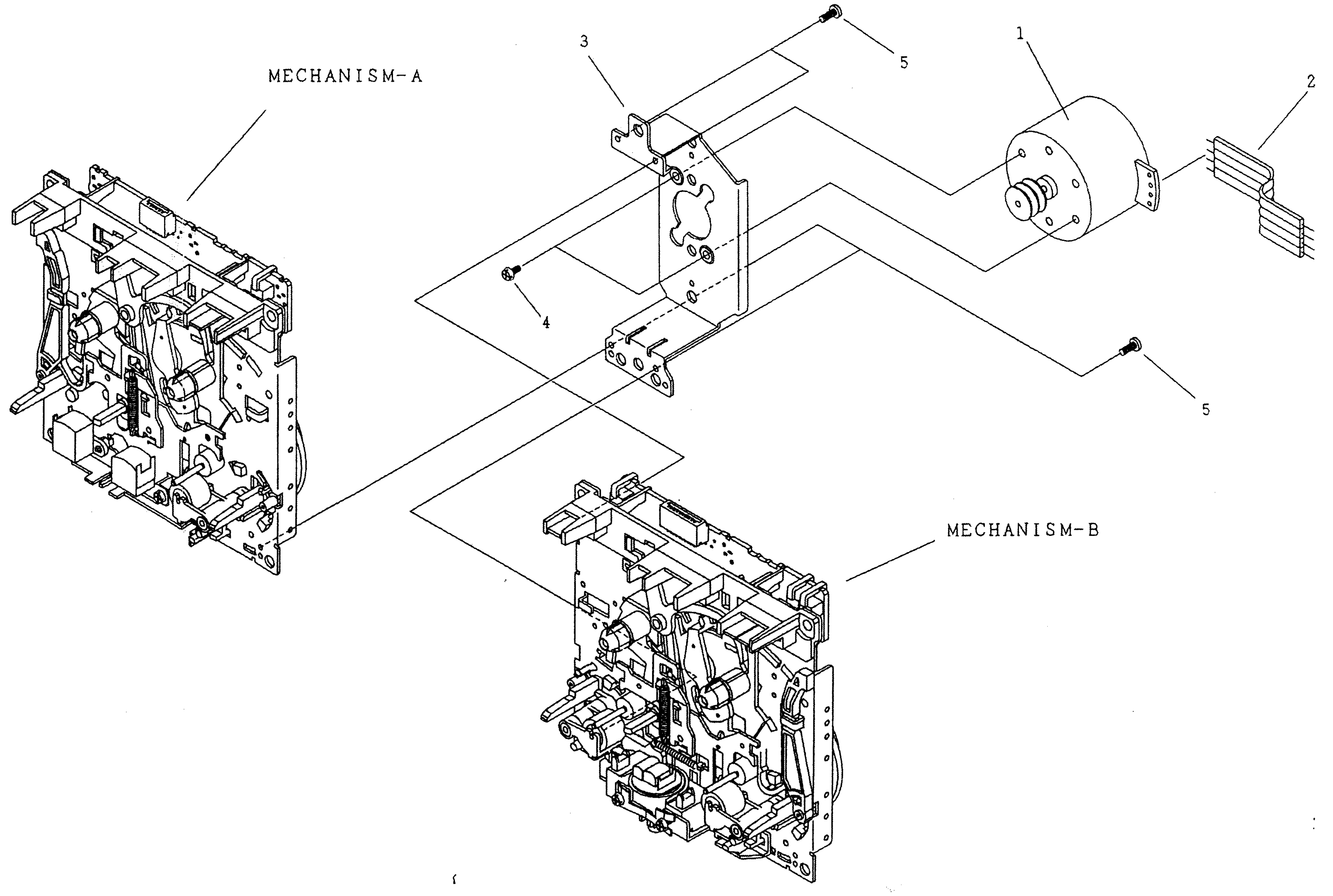
1	4822 691 10671	Tape Mechanism CWB44FR502
3	-	Screw M2 x 16
6	4822 320 12243	Flex Cable 6 pin 18 cm
7	4822 320 12242	Flex Cable 10 pin 7,5 cm
9	-	Screw D3 x 10

Note: Only the parts mentioned in this list are normal service spare parts.

TAPE MECHANISM A & B EXPLODED VIEW

1	4822 361 10841	Motor Assembly
4	-	Screw M2,6 x 4
5	-	Screw M2 x 3

Note: Only the parts mentioned in this list are normal service spare parts.



ELECTRICAL PARTS LIST - ETF5 DOLBY BOARD

MISCELLANEOUS

1740	4822 267 10729	Flex connector 10 pin
1750	4822 267 10731	Flex connector 6 pin

CAPACITORS

2621	5322 122 34123	1nF 10% 50V
2622	5322 122 34099	470pF 10% 63V
2623	4822 122 33575	220pF 5% 50V
2624	4822 126 13296	100nF 10% 16V
2625	4822 126 13296	100nF 10% 16V
2631	4822 126 12944	47nF 10% 50V
2632	4822 126 12944	47nF 10% 50V
2633	4822 126 13473	220nF +80/-20% 50V
2634	4822 126 13473	220nF +80/-20% 50V
2635	4822 122 33891	3,3nF 10% 63V
2636	4822 122 33891	3,3nF 10% 63V
2637	5322 121 42498	680nF 5% 63V
2638	5322 121 42498	680nF 5% 63V
2639	5322 122 32531	100pF 5% 50V
2640	5322 122 32531	100pF 5% 50V
2641	4822 124 40246	4,7µF 20% 63V
2642	4822 124 40246	4,7µF 20% 63V
2643	4822 126 12105	33nF 5% 63V
2644	4822 126 12105	33nF 5% 63V
2645	5322 122 32658	22pF 5% 50V
2646	5322 122 32658	22pF 5% 50V
2647	4822 124 40246	4,7µF 20% 63V
2648	4822 124 40246	4,7µF 20% 63V
2649	5322 122 33861	120pF 10% 50V
2650	5322 122 33861	120pF 10% 50V
2651	4822 126 10326	180pF 5% 63V
2652	4822 126 10326	180pF 5% 63V
2653	5322 122 34099	470pF 10% 63V
2654	5322 122 34099	470pF 10% 63V
2691	4822 124 41576	2,2µF 20% 50V
2692	4822 124 41584	100µF 20% 10V
2693	4822 124 81029	100µF 20% 25V
2694	4822 124 81029	100µF 20% 25V
2695	4822 124 41576	2,2µF 20% 50V
2696	4822 124 41576	2,2µF 20% 50V
2701	4822 122 33805	330pF 10% 63V
2702	4822 122 33805	330pF 10% 63V
2703	5322 122 32531	100pF 5% 50V
2704	5322 122 32531	100pF 5% 50V
2705	5322 122 31863	330pF 5% 50V
2706	5322 122 31863	330pF 5% 50V
2707	5322 122 34099	470pF 10% 63V
2708	5322 122 34099	470pF 10% 63V
2709	5322 122 31863	330pF 5% 50V
2710	5322 122 31863	330pF 5% 50V
2711	5322 122 32531	100pF 5% 50V
2712	5322 122 32531	100pF 5% 50V
2713	4822 124 41579	10µF 20% 50V
2714	4822 124 41579	10µF 20% 50V
2715	4822 124 41584	100µF 20% 10V
2716	4822 124 41584	100µF 20% 10V
2717	4822 122 33175	2,2nF 20% 50V
2718	4822 122 33175	2,2nF 20% 50V
2719	4822 126 13188	15nF 5% 63V
2720	4822 126 13188	15nF 5% 63V
2727	4822 122 32535	680pF 10% 63V
2728	4822 122 32535	680pF 10% 63V
2729	4822 122 32541	27nF 10% 63V
2730	4822 122 32541	27nF 10% 63V
2733	5322 122 34099	470pF 10% 63V
2734	5322 122 34099	470pF 10% 63V
2735	4822 126 13296	100nF 10% 16V
2737	4822 126 13296	100nF 10% 16V
2738	4822 126 13296	100nF 10% 16V
2741	4822 126 11585	22nF+80/- 20% 25V
2742	5322 122 32654	22nF 10% 63V
2743	4822 126 13296	100nF 10% 16V
2744	4822 126 13296	100nF 10% 16V
2760	4822 126 13296	100nF 10% 16V
2761	4822 124 22263	220µF 20% 25V
2762	4822 124 40246	4,7µF 20% 63V
2763	4822 124 40433	47µF 20% 25V
2765	4822 124 40433	47µF 20% 25V
2769	5322 122 34099	470pF 10% 63V
2770	5322 122 34099	470pF 10% 63V
2780	4822 124 81151	22µF 50V
2781	4822 122 33177	10nF 20% 50V
2782	5322 126 10223	4,7nF 10% 63V
2784	4822 121 51305	15nF 10% 50V
2785	4822 124 40242	1µF 20% 63V
2786	5322 122 32531	100pF 5% 50V
2787	4822 126 12105	33nF 5% 63V

RESISTORS

3601	4822 117 11449	2k2 1% 0,1W
3602	4822 051 20273	27k 5% 0,1W
3603	4822 117 11449	2k2 1% 0,1W
3604	4822 051 20563	56k 5% 0,1W
3605	4822 117 11449	2k2 1% 0,1W
3606	4822 051 20124	120k 5% 0,1W
3607	4822 116 52256	2k2 5% 0,5W
3608	4822 051 20273	27k 5% 0,1W
3609	4822 116 52256	2k2 5% 0,5W
3610	4822 051 20124	120k 5% 0,1W
3611	4822 116 52256	2k2 5% 0,5W
3612	4822 051 20563	56k 5% 0,1W
3613	4822 051 20273	27k 5% 0,1W
3614	4822 051 20273	27k 5% 0,1W
3616	4822 051 20822	8k2 5% 0,1W
3618	4822 051 20822	8k2 5% 0,1W

ELECTRICAL PARTS LIST - ETF5 DOLBY BOARD

3620	5322 100 11542	Trimmer 4k7 30% 0,1W
3622	5322 100 11542	Trimmer 4k7 30% 0,1W
3623	4822 051 20104	100k 5% 0,1W
3624	4822 051 20104	100k 5% 0,1W
3625	4822 051 10102	1k 2% 0,25W
3626	4822 051 10102	1k 2% 0,25W
3628	4822 051 20104	100k 5% 0,1W
3630	4822 051 20471	470R 5% 0,1W
3631	4822 117 10834	47k 1% 0,1W
3632	4822 117 10834	47k 1% 0,1W
3633	4822 051 20332	3k3 5% 0,1W
3634	4822 051 20332	3k3 5% 0,1W
3635	4822 100 11771	Trimmer 20k 30% 0,1W
3636	4822 100 11771	Trimmer 20k 30% 0,1W
3637	4822 051 20104	100k 5% 0,1W
3638	4822 051 20104	100k 5% 0,1W
3639	4822 051 20332	3k3 5% 0,1W
3640	4822 051 20332	3k3 5% 0,1W
3641	4822 100 11771	Trimmer 20k 30% 0,1W
3642	4822 100 11771	Trimmer 20k 30% 0,1W
3643	4822 051 20104	100k 5% 0,1W
3644	4822 051 20104	100k 5% 0,1W
3645	4822 051 20683	68k 5% 0,1W
3646	4822 051 20683	68k 5% 0,1W
3647	4822 051 20332	3k3 5% 0,1W
3648	4822 051 20332	3k3 5% 0,1W
3649	4822 051 20562	5k6 5% 0,1W
3650	4822 051 20562	5k6 5% 0,1W
3651	4822 051 10102	1k 2% 0,25W
3652	4822 050 11002	1k 1% 0,4W
3655	5322 100 11542	Trimmer 4k7 30% 0,1W
3656	5322 100 11542	Trimmer 4k7 30% 0,1W
3657	4822 051 10102	1k 2% 0,25W
3658	4822 051 10102	1k 2% 0,25W
3659	4822 051 20223	22k 5% 0,1W
3660	4822 051 20223	22k 5% 0,1W
3661	4822 051 20474	470k 5% 0,1W
3662	4822 051 20474	470k 5% 0,1W
3663	4822 051 20154	150k 5% 0,1W
3664	4822 051 20154	150k 5% 0,1W
3665	4822 051 20683	68k 5% 0,1W
3666	4822 051 20683	68k 5% 0,1W
3667	4822 051 20109	10R 5% 0,1W
3668	4822 051 20109	10R 5% 0,1W
3669	4822 051 20472	4k7 5% 0,1W
3670	4822 051 20472	4k7 5% 0,1W
3672	4822 051 20472	4k7 5% 0,1W
3674	4822 116 52283	4k7 5% 0,5W
3676	4822 117 10834	47k 1% 0,1W
3678	4822 117 10834	47k 1% 0,1W
3679	4822 117 10834	47k 1% 0,1W
3680	4822 117 10834	47k 1% 0,1W
3683	4822 117 10834	47k 1% 0,1W
3684	4822 117 10834	47k 1% 0,1W
3685	4822 116 52234	100k 5% 0,5W
3686	4822 051 20104	100k 5% 0,1W
3689	4822 051 20124	120k 5% 0,1W
3690	4822 116 83882	39k 5% 0,5W
3691	4822 117 10833	10k 1% 0,1W
3692	4822 051 20683	68k 5% 0,1W
3693	4822 116 52199	68R 5% 0,5W
3694	4822 052 10109 ⚠	10R 5% 0,33W
3695	4822 051 20689	68R 5% 0,1W
3701	4822 117 11503	220R 1% 0.1W
3702	4822 117 11503	220R 1% 0.1W
3703	4822 117 11503	220R 1% 0.1W
3704	4822 117 11503	220R 1% 0.1W
3705	4822 117 11503	220R 1% 0.1W
3706	4822 117 11503	220R 1% 0.1W
3707	4822 051 20101	100R 5% 0,1W
3708	4822 051 20101	100R 5% 0,1W
3709	4822 051 20229	22R 5% 0,1W
3710	4822 051 20229	22R 5% 0,1W
3711	4822 051 20104	100k 5% 0,1W
3712	4822 051 20104	100k 5% 0,1W
3713	4822 051 20121	120R 5% 0,1W
3714	4822 051 20121	120R 5% 0,1W
3715	4822 051 10102	1k 2% 0,25W
3716	4822 051 10102	1k 2% 0,25W
3717	4822 051 20392	3k9 5% 0,1W
3718	4822 051 20392	3k9 5% 0,1W
3719	4822 051 20822	8k2 5% 0,1W
3720	4822 051 20822	8k2 5% 0,1W
3721	4822 051 20562	5k6 5% 0,1W
3722	4822 051 20562	5k6 5% 0,1W
3723	4822 117 11383	12k 1% 0,1W
3724	4822 117 11383	12k 1% 0,1W
3727	4822 051 20562	5k6 5% 0,1W
3728	4822 051 20562	5k6 5% 0,1W
3729	4822 117 12955	2k7 1% 0,1W
3730	4822 117 12955	2k7 1% 0,1W
3731	4822 051 20562	5k6 5% 0,1W
3732	4822 051 20562	5k6 5% 0,1W
3733	4822 051 20562	5k6 5% 0,1W
3734	4822 051 20562	5k6 5% 0,1W
3735	4822 051 20153	15k 5% 0,1W
3736	4822 051 20153	15k 5% 0,1W
3737	4822 051 20332	3k3 5% 0,1W
3738	4822 051 20332	3k3 5% 0,1W
3739	4822 051 20472	4k7 5% 0,1W
3740	4822 117 10834	47k 1% 0,1W
3741	4822 117 11454	820R 1% 0,1W
3742	4822 117 11454	820R 1% 0,1W
3743	4822 051 20122	1k2 5% 0,1W

ELECTRICAL PARTS LIST - ETF5 DOLBY BOARD

RESISTORS

3744	4822 051 20122	1k2 5% 0,1W
3745	4822 051 20392	3k9 5% 0,1W
3746	4822 051 20392	3k9 5% 0,1W
3748	4822 117 11449	2k2 1% 0,1W
3749	4822 117 10834	47k 1% 0,1W
3751	4822 117 10833	10k 1% 0,1W
3752	4822 051 20104	100k 5% 0,1W
3753	4822 051 20104	100k 5% 0,1W
3754	4822 051 20333	33k 5% 0,1W
3756	4822 051 20224	220k 5% 0,1W
3757	4822 051 20224	220k 5% 0,1W
3758	4822 117 10833	10k 1% 0,1W
3759	4822 117 10833	10k 1% 0,1W
3760	4822 051 20121	120R 5% 0,1W
3761	4822 116 83864	10k 5% 0,5W
3762	4822 117 11454	820R 1% 0,1W
3763	4822 051 20154	150k 5% 0,1W
3764	4822 116 83872	220R 5% 0,5W
3765	4822 051 20393	39k 5% 0,1W
3766	4822 051 20475	4M7 5% 0,1W
3767	4822 051 20475	4M7 5% 0,1W
3768	4822 117 10833	10k 1% 0,1W
3769	4822 117 10833	10k 1% 0,1W
3770	4822 117 11139	1k5 1% 0,1W
3771	4822 051 20122	1k2 5% 0,1W
3772	4822 051 20562	5k6 5% 0,1W
3773	5322 100 11542	Trimmer 4k7 30% 0,1W
3774	4822 051 20822	8k2 5% 0,1W
3775	4822 051 20478	4R7 5% 0,1W
3776	4822 117 11507	6k8 1% 0,1W
3777	4822 117 10353	150R 1% 0,1W
3778	4822 052 10688	⚠ 6R8 5% 0,33W
3779	4822 051 20334	330k 5% 0,1W
3780	4822 051 20105	1M 5% 0,1W
3781	4822 051 20475	4M7 5% 0,1W
3782	4822 051 20153	15k 5% 0,1W
3783	4822 051 20472	4k7 5% 0,1W
3784	4822 051 20472	4k7 5% 0,1W
3785	5322 100 11539	Trimmer 100k 30% 0,1W
3786	4822 051 20223	22k 5% 0,1W
3787	4822 051 20105	1M 5% 0,1W
3788	4822 051 20105	1M 5% 0,1W
3789	4822 117 10834	47k 1% 0,1W
4601	4822 051 20008	0R Jumper 0805
4602	4822 051 20008	0R Jumper 0805
4603	4822 051 20008	0R Jumper 0805
4604	4822 051 20008	0R Jumper 0805
4605	4822 051 20008	0R Jumper 0805
4606	4822 051 20008	0R Jumper 0805
4607	4822 051 20008	0R Jumper 0805
4608	4822 051 20008	0R Jumper 0805
4696	4822 051 20008	0R Jumper 0805
4610	4822 051 20008	0R Jumper 0805
4701	4822 051 20008	0R Jumper 0805
4702	4822 051 20008	0R Jumper 0805
4703	4822 051 20008	0R Jumper 0805
4704	4822 051 20008	0R Jumper 0805
4705	4822 051 20008	0R Jumper 0805
4706	4822 051 20008	0R Jumper 0805
4707	4822 051 20008	0R Jumper 0805
4708	4822 051 20008	0R Jumper 0805
4709	4822 051 20008	0R Jumper 0805
4710	4822 051 20008	0R Jumper 0805
4711	4822 051 20008	0R Jumper 0805
4712	4822 051 20008	0R Jumper 0805
4713	4822 051 20008	0R Jumper 0805
4714	4822 051 20008	0R Jumper 0805
4715	4822 051 20008	0R Jumper 0805
4716	4822 051 20008	0R Jumper 0805
4717	4822 051 20008	0R Jumper 0805
4718	4822 051 20008	0R Jumper 0805
4719	4822 051 20008	0R Jumper 0805
4720	4822 051 20008	0R Jumper 0805
4721	4822 051 20008	0R Jumper 0805
4722	4822 051 20008	0R Jumper 0805
4723	4822 051 20008	0R Jumper 0805
4724	4822 051 20008	0R Jumper 0805
4725	4822 051 20008	0R Jumper 0805
4726	4822 051 20008	0R Jumper 0805
4727	4822 051 20008	0R Jumper 0805
4728	4822 051 20008	0R Jumper 0805
4729	4822 051 20008	0R Jumper 0805
4730	4822 051 20008	0R Jumper 0805
4731	4822 051 20008	0R Jumper 0805
4732	4822 051 20008	0R Jumper 0805
4733	4822 051 20008	0R Jumper 0805
4734	4822 051 20008	0R Jumper 0805
4735	4822 051 20008	0R Jumper 0805
4736	4822 051 20008	0R Jumper 0805
4737	4822 051 20008	0R Jumper 0805
4738	4822 051 20008	0R Jumper 0805
4739	4822 051 20008	0R Jumper 0805
4740	4822 051 20008	0R Jumper 0805
4741	4822 051 20008	0R Jumper 0805
4742	4822 051 20008	0R Jumper 0805
4783	4822 051 20008	0R Jumper 0805

COILS & FILTERS

5631	4822 156 21725	MPX Filter LXD-210
5632	4822 156 21725	MPX Filter LXD-210
5701	4822 156 21721	Fixed Inductor 2µ2 10%
5702	4822 156 21721	Fixed Inductor 2µ2 10%
5703	4822 156 20946	OSC COIL 100kHz

ELECTRICAL PARTS LIST - ETF5 DOLBY BOARD

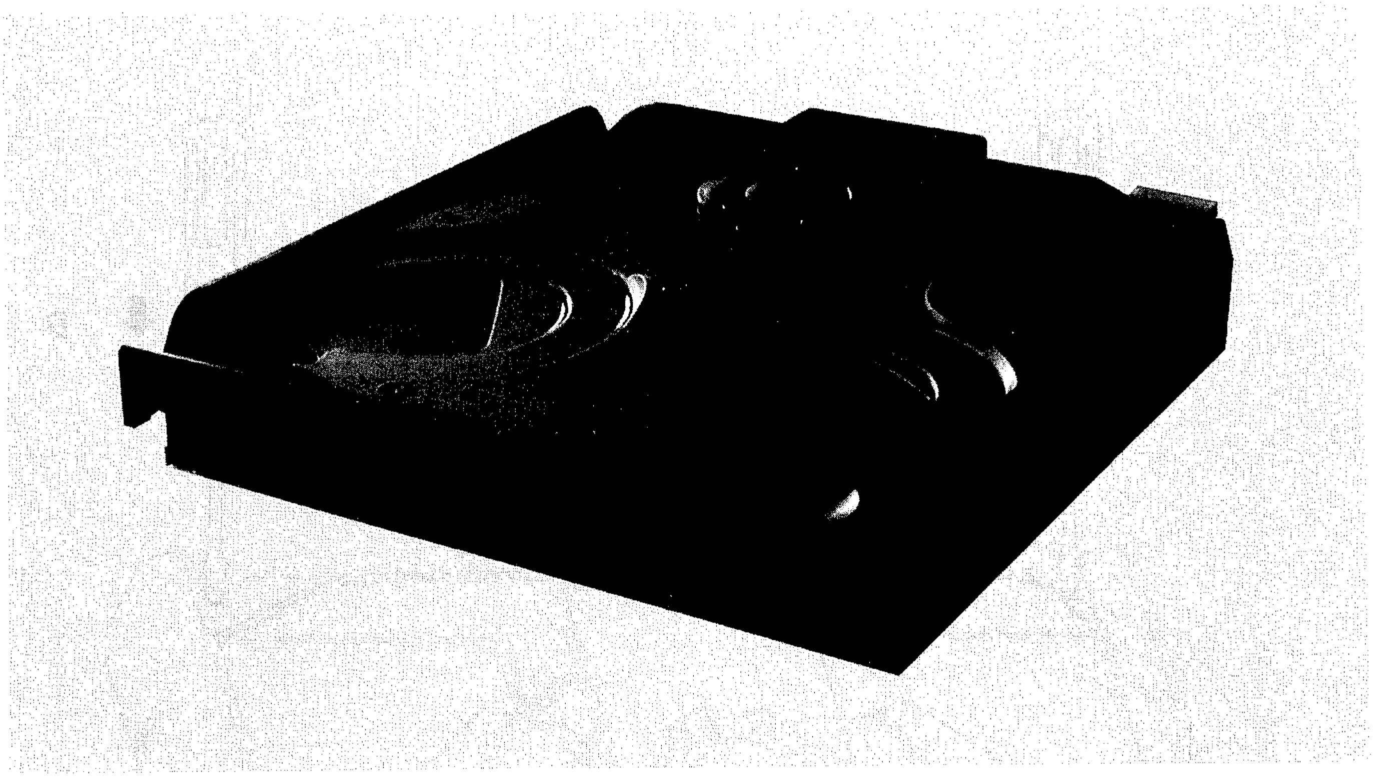
DIODES

6611	4822 130 31878	1N4003G
6612	4822 130 31878	1N4003G
6614	4822 130 30621	1N4148
6770	4822 130 30621	1N4148
6771	4822 130 30621	1N4148
6772	4822 130 30621	1N4148
6773	4822 130 30621	1N4148
6774	4822 130 30621	1N4148
6775	4822 130 30621	1N4148
6776	4822 130 30621	1N4148
6777	4822 130 34382	BZX79-C8V2
6778	4822 130 30621	1N4148
6782	4822 130 30621	1N4148
6785	4822 130 30621	1N4148
6786	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7610	5322 209 11306	HEF4094BT
7612	5322 130 60845	BC807-25
7613	5322 130 60845	BC807-25
7614	5322 130 60845	BC807-25
7616	5322 130 60508	BC857B
7618	4822 130 60511	BC847B
7619	4822 130 60511	BC847B
7620	4822 130 60511	BC847B
7622	4822 130 60511	BC847B
7623	4822 130 60511	BC847B
7624	4822 130 60511	BC847B
7630	4822 209 90406	CXA1101M
7631	4822 130 60511	BC847B
7632	4822 130 60511	BC847B
7633	4822 130 60511	BC847B
7634	4822 130 60511	BC847B
7635	4822 130 60511	BC847B
7636	4822 130 60511	BC847B
7637	4822 130 60511	BC847B
7638	4822 130 60511	BC847B
7640	4822 209 83357	NJM4560M
7710	4822 209 32919	HEF4952BT
7720	4822 209 32918	AN7318S
7730	4822 209 32919	HEF4952BT
7740	4822 209 32919	HEF4952BT
7780	4822 130 60511	BC847B
7781	4822 130 60511	BC847B
7782	4822 130 44568	BC557B
7783	4822 130 60511	BC847B
7784	5322 130 60508	BC857B
7785	4822 130 63494	J111
7786	4822 130 63494	J111
7787	4822 130 60511	BC847B
7788	4822 130 60511	BC847B
7789	4822 130 60511	BC847B
7790	4822 130 60511	BC847B
7791	4822 130 60511	BC847B
7792	4822 130 60511	BC847B

Note: Only the parts mentioned in this list are normal service spare parts.



3CDC Module

(3 Disc Carrousel Changer)

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Component Layout Main Board.....................................10-12
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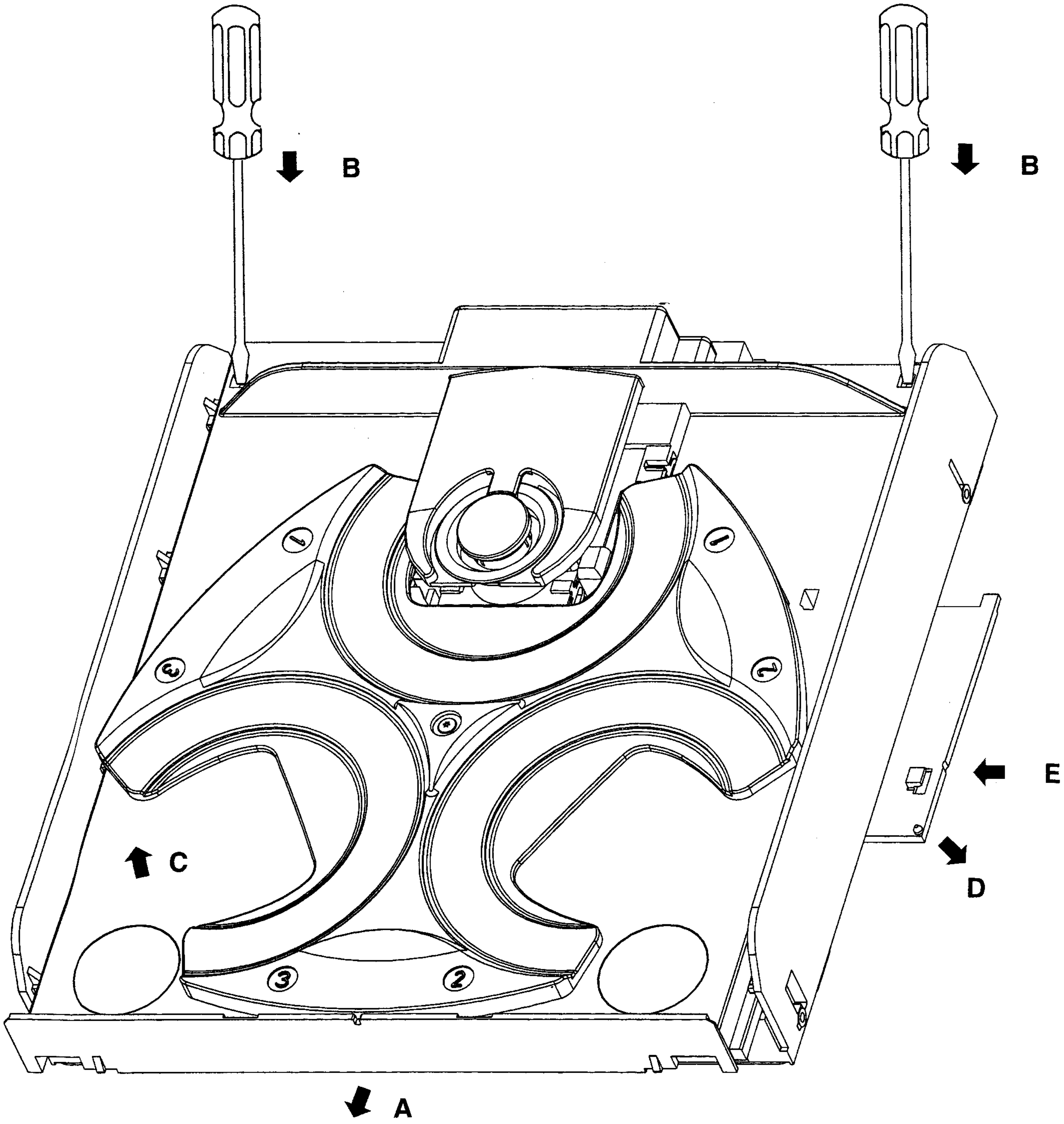
Demounting Hints



Demounting of Drawer

→ **A** Pull drawer outwards
→ **B** Unlock drawer with screwdriver
→ **C** Lift drawer to demount from chassis

Demounting of Flex Plate

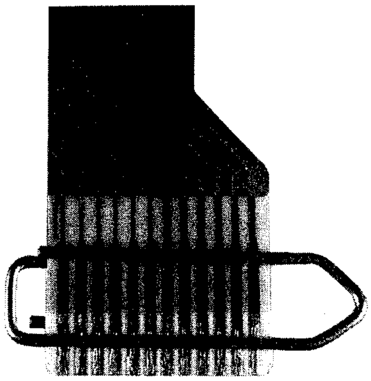
→ **D** Lift plate to unlock pin from bottom plate
→ **E** Move plate inwards to demount from bottom plate

Servicing Hints

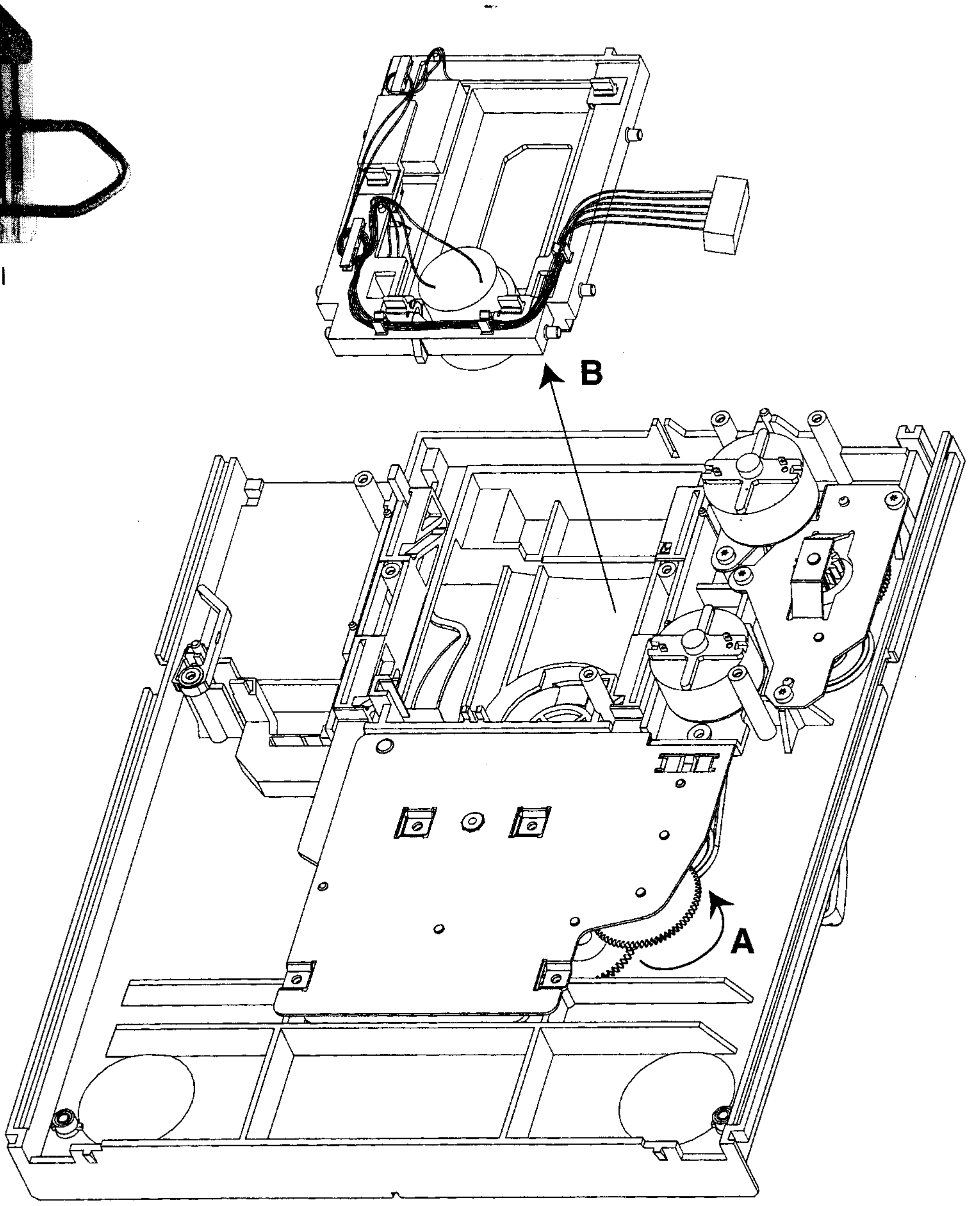
Replacement of CD Drive

See also exploded view of changer mechanism.

1. Demount flex plate (pos 140).
2. Demount printed circuit board: remove 6 screws and desolder lips of tray motor and carrousel motor.
3. Disconnect flexfoil and JST connector of CD drive from Printed circuit board. Shortcircuit the flexfoil with a paperclip to protect the laser against ESD.
4. Remove 2 screws (pos 107,108) and demount CD drive lockings (pos 105,106).
5. Turn gearwheel (pos 42) of disc change mechanism by finger to move CD drive support in upper position as shown in picture below Ⓐ.
6. Demount CD drive support (pos 95) Ⓑ.
7. Replace CD drive (pos 100). The wire tree of JST connector has to be desoldered and resoldered on the new CD drive again.



CD drive flex foil

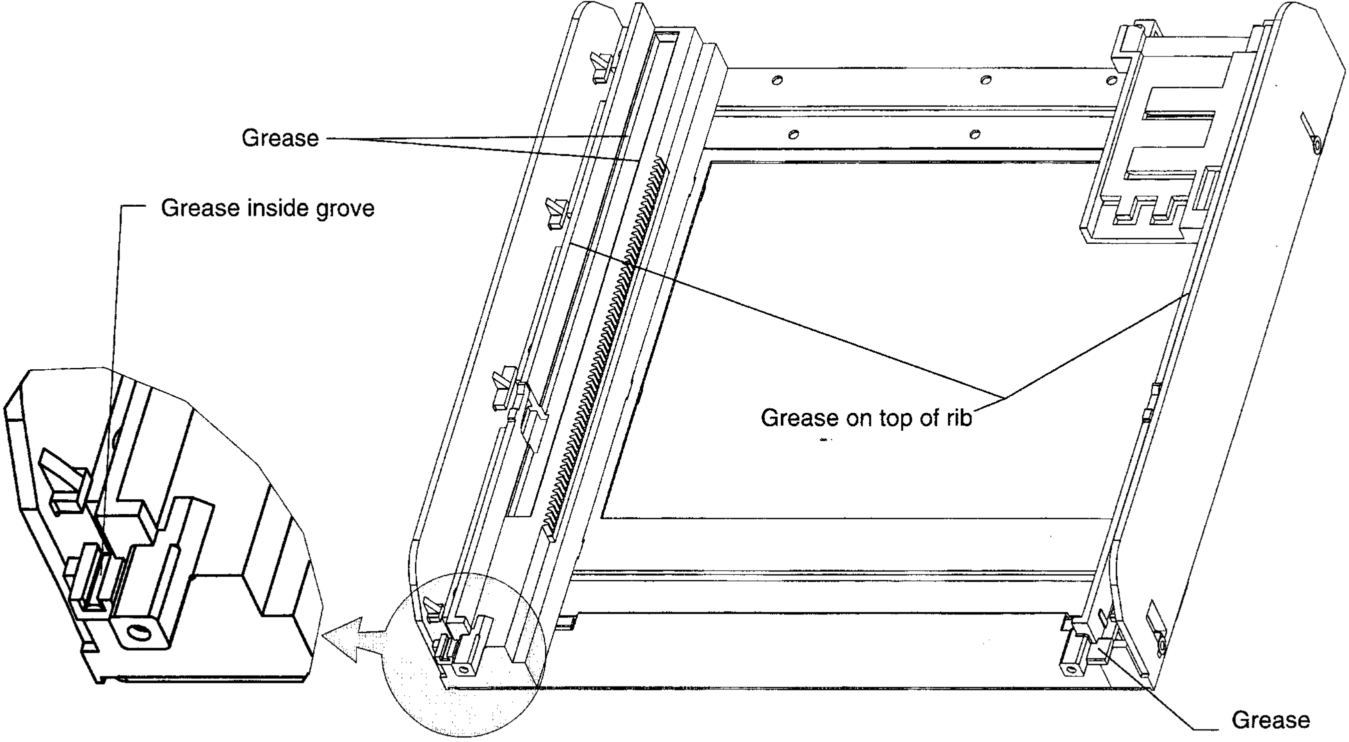


Mounting of Carrousel

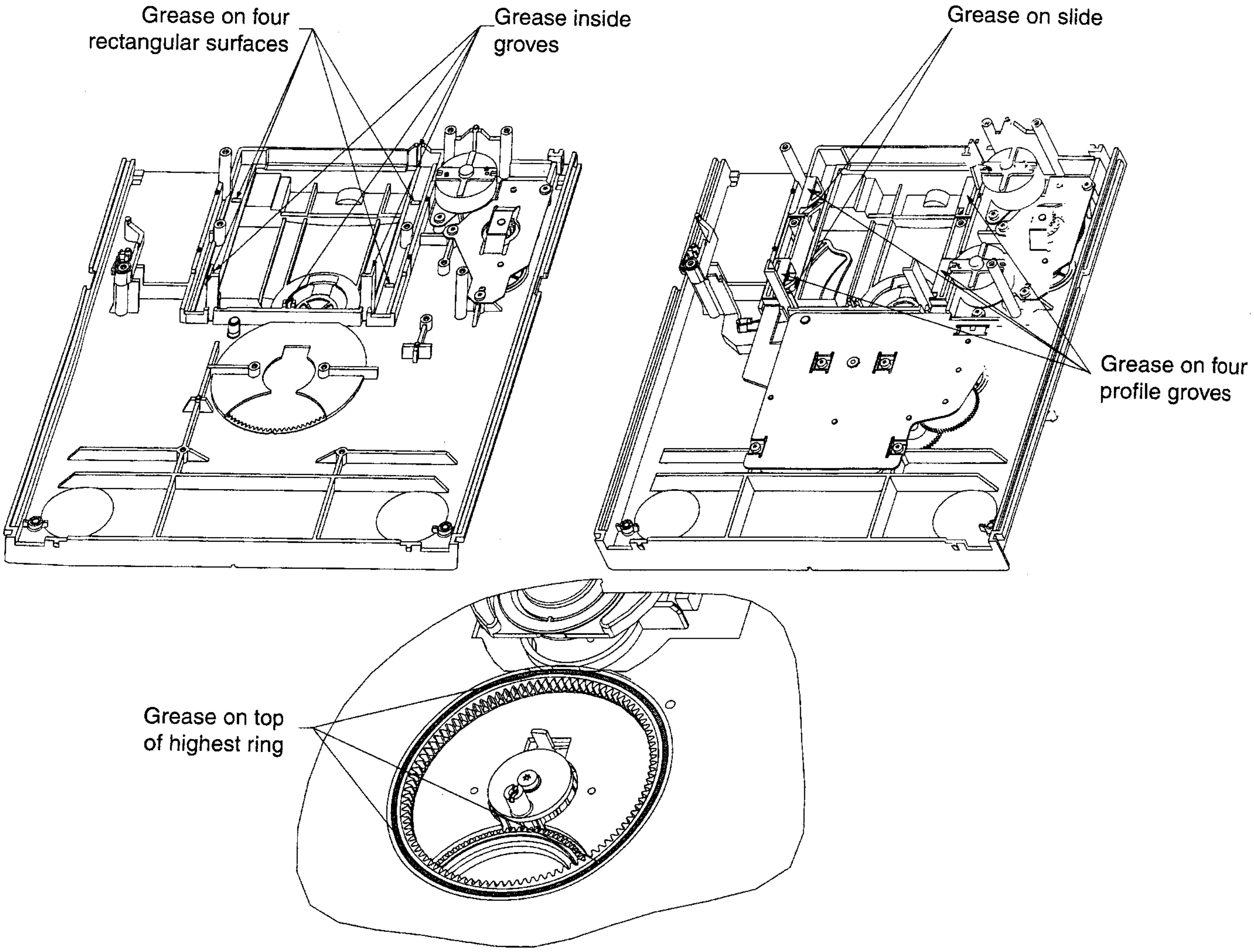
1. Turn gearwheel (pos 42) of disc change mechanism by finger until CD drive is in play position.
2. Mount carrousel (pos 115) so that disc is positioned right on turntable. Carrousel position number doesn´t matter.

Lubrication Instructions

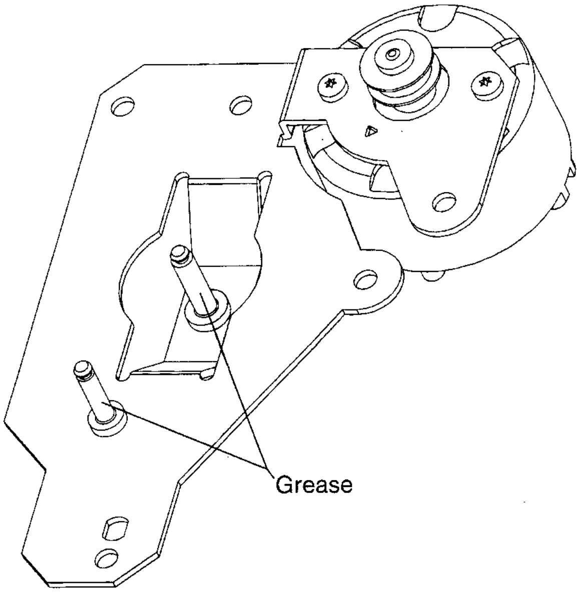
CHASSIS


Grease
Grease inside grove
Grease on top of rib
Grease

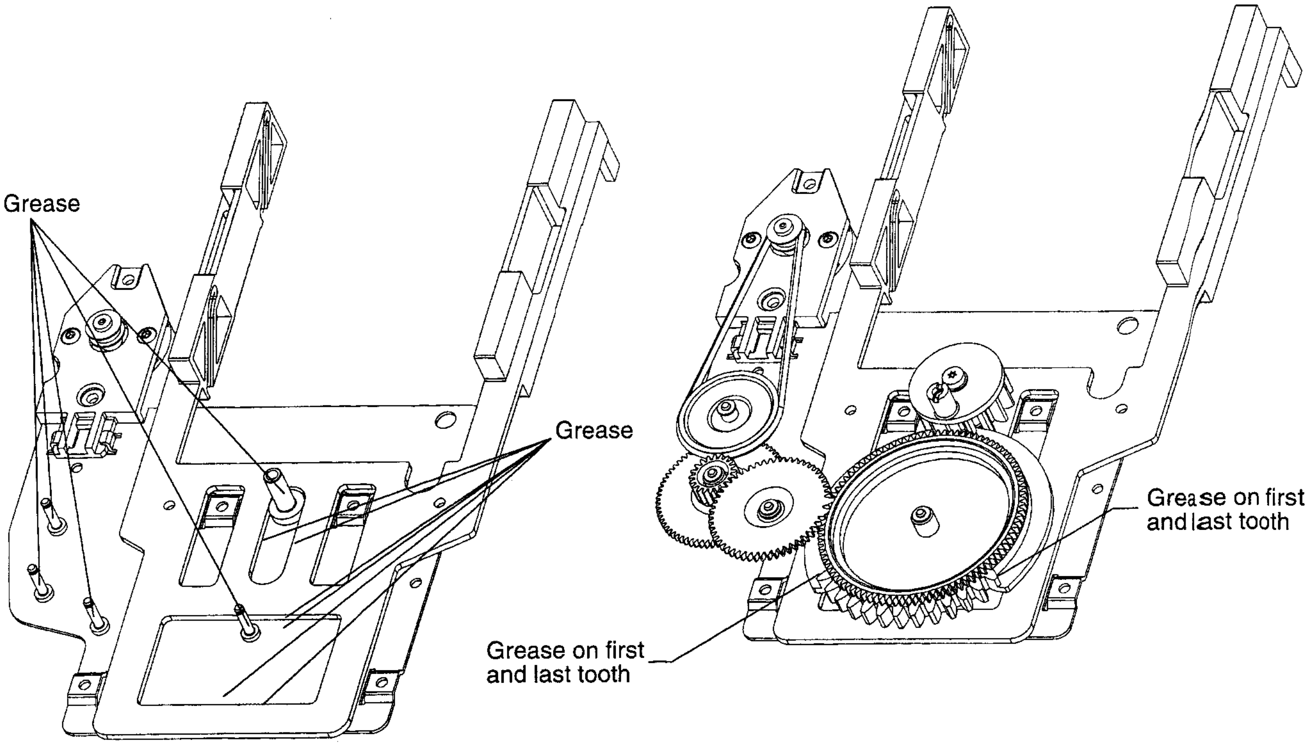
DRAWER


Grease on four rectangular surfaces
Grease inside groves
Grease on slide
Grease on four profile groves
Grease on top of highest ring

DRAWER MECHANISM



DISC CHANGE MECHANISM


Grease
Grease
Grease on first and last tooth
Grease on first and last tooth

Use only grease **Polylub GLY 801** service codenumber 4822 390 10136

WARNING

CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CD DRIVE ELECTRONICS WHEN CONNECTING A NEW CDM MECHANISM. THAT´S WHY, BESIDES THE SAFETY MEASURES LIKE
- ***SWITCH OFF POWER SUPPLY***
- ***ESD PROTECTION***

ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.

The following steps have to be done when replacing the CDM mechanism:

1. Disconnect old CD drive flexfoil from printed board
2. Connect paperclip to CD drive flexfoil to short-circuit flexfoil (fig.1)
3. Short-circuit printed board with **brass-sheet (4822 321 11197)** plugged into the flexfoil connector (fig.2)
4. Remove old CD drive mechanism
5. Position new CD mechanism in its studs
6. Remove short-circuit from printed board connector
7. Remove short-circuit from flexfoil of new CD drive
8. Connect new flexfoil to print connector (fig.3)

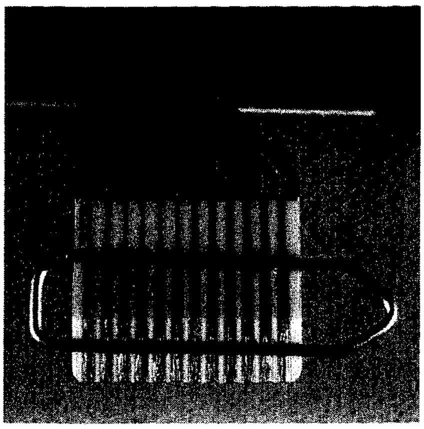


fig.1

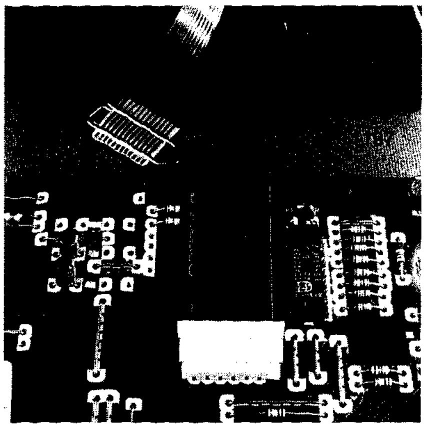


fig.2

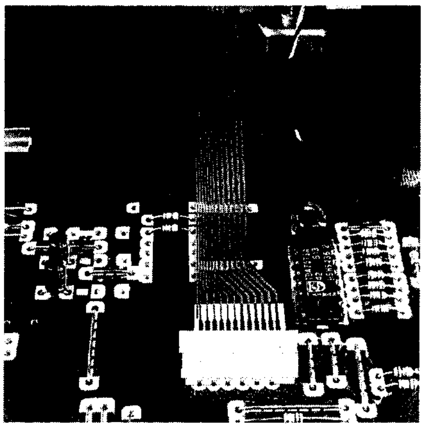
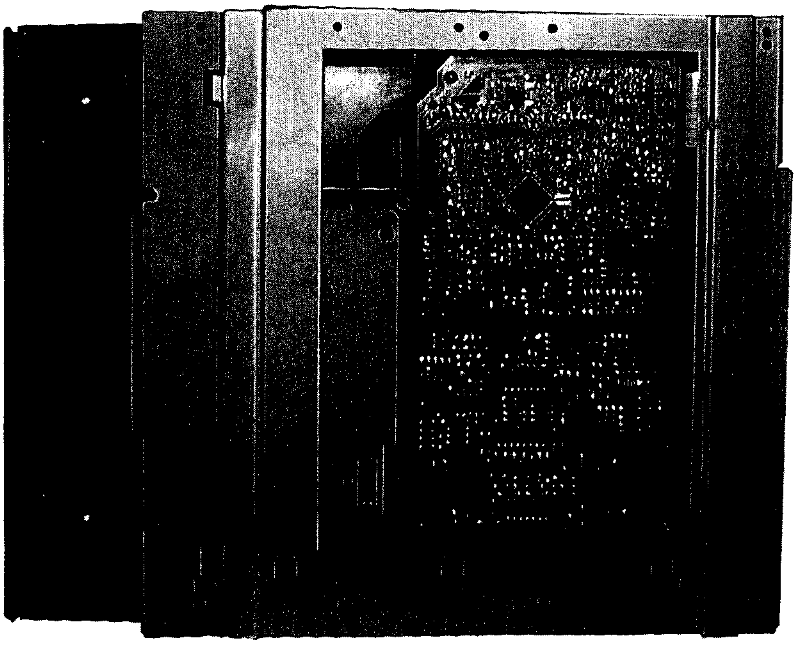
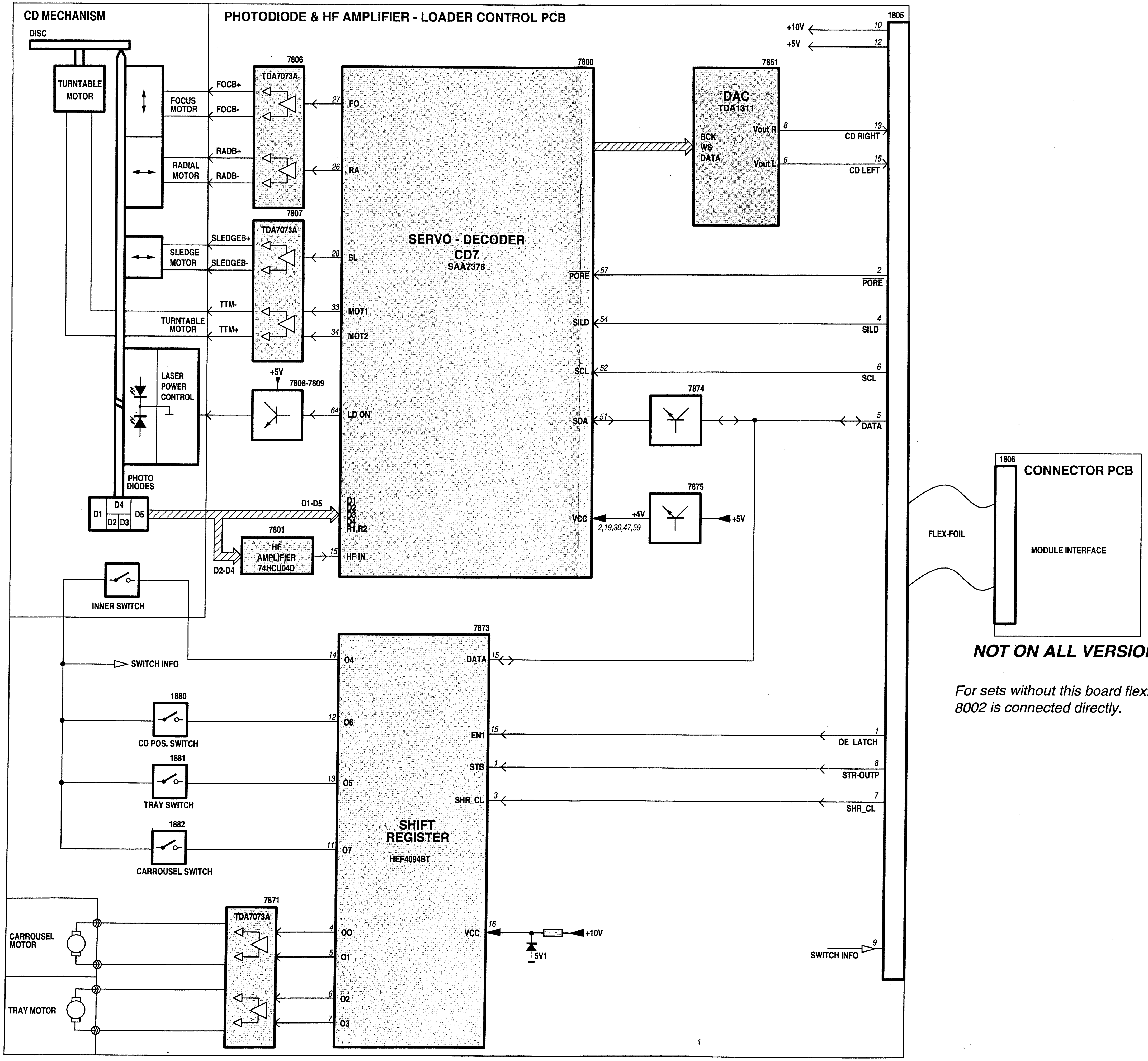


fig.3

Service Position



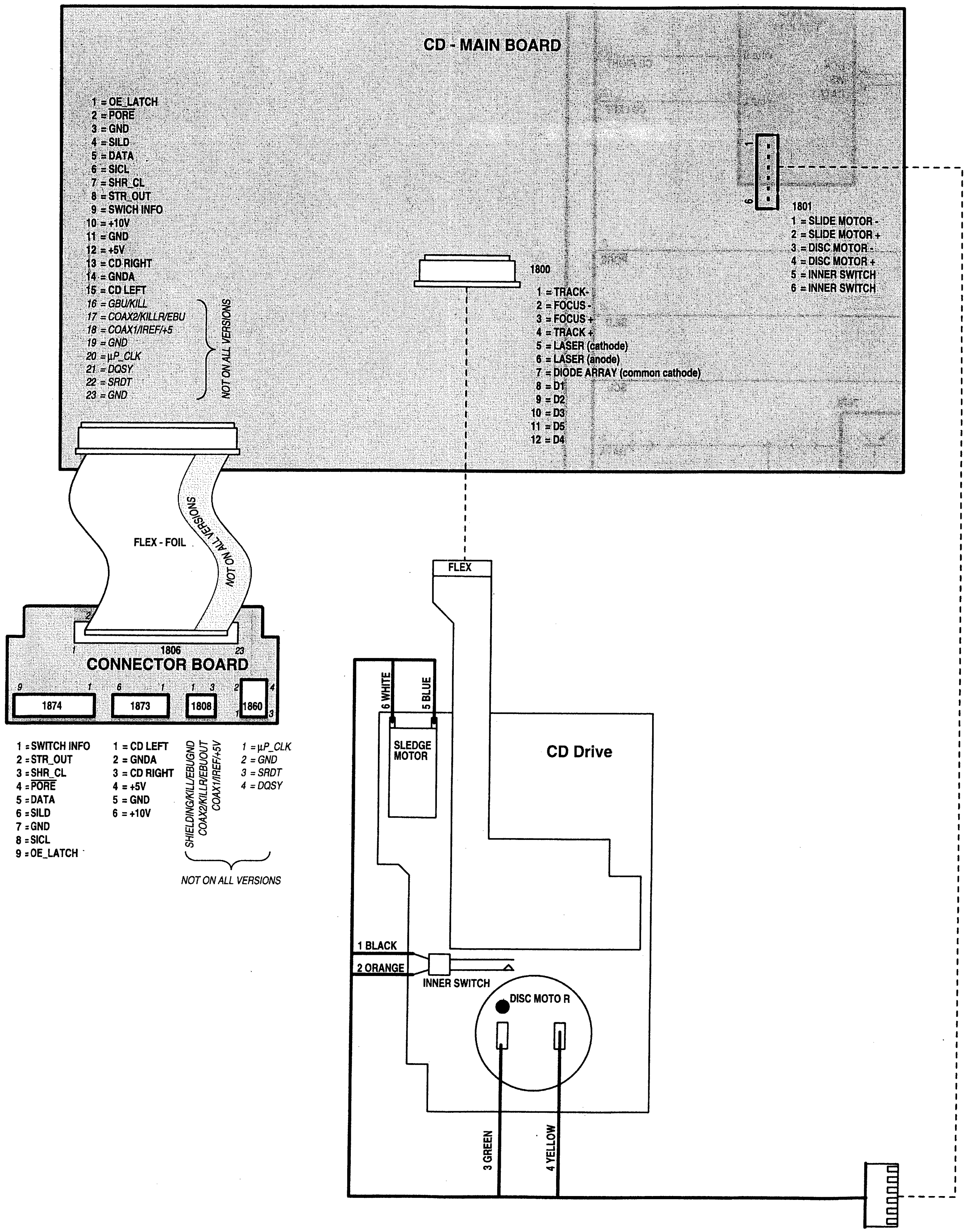
Blockdiagram


CD MECHANISM
DISC
TURNTABLE MOTOR
FOCUS MOTOR
RADIAL MOTOR
SLEDGE MOTOR
TURNTABLE MOTOR
LASER POWER CONTROL
PHOTO DIODES
D1
D2
D3
D4
D5
INNER SWITCH
PHOTODIODE & HF AMPLIFIER - LOADER CONTROL PCB
7806
TDA7073A
FOCB+
FOCB-
RADB+
RADB-
7807
TDA7073A
SLEDGEB+
SLEDGEB-
TTM-
TTM+
+5V
7808-7809
D1-D5
7801
HF AMPLIFIER 74HCU04D
D2-D4
7800
SERVO - DECODER
CD7
SAA7378
27 FO
26 RA
28 SL
33 MOT1
34 MOT2
64 LD ON
D1 D2 D3 D4 R1,R2
15 HF IN
57 PORE
54 SILD
52 SCL
51 SDA
VCC
+4V
2,19,30,47,59
7874
7875
+5V
7851
DAC
TDA1311
BCK
WS
DATA
Vout R 8
Vout L 6
+10V
+5V
1805
10
12
13 CD RIGHT
15 CD LEFT
2 PORE
4 SILD
6 SCL
5 DATA
1 OE_LATCH
8 STR-OUTP
7 SHR_CL
9 SWITCH INFO
FLEX-FOIL
1806
CONNECTOR PCB
MODULE INTERFACE
SWITCH INFO
1880
CD POS. SWITCH
1881
TRAY SWITCH
1882
CARROUSEL SWITCH
7873
SHIFT REGISTER
HEF4094BT
14 O4
12 O6
13 O5
11 O7
4 O0
5 O1
6 O2
7 O3
15 DATA
15 EN1
1 STB
3 SHR_CL
16 VCC
+10V
5V1
7871
TDA7073A
CARROUSEL MOTOR
TRAY MOTOR

NOT ON ALL VERSIONS

For sets without this board flexfoil 8002 is connected directly.

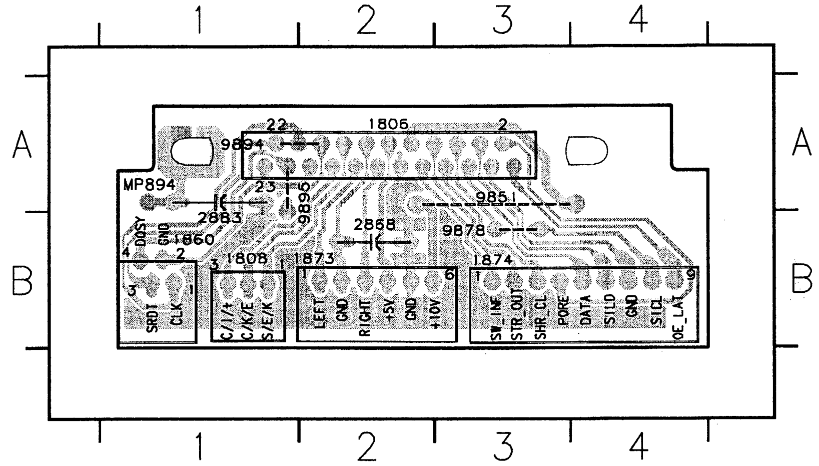
Wiring diagram


CD - MAIN BOARD
1 = OE_LATCH
2 = PORE
3 = GND
4 = SILD
5 = DATA
6 = SICL
7 = SHR_CL
8 = STR_OUT
9 = SWICH INFO
10 = +10V
11 = GND
12 = +5V
13 = CD RIGHT
14 = GNDA
15 = CD LEFT
16 = GBU/KILL
17 = COAX2/KILLR/EBU
18 = COAX1/IREF/+5
19 = GND
20 = µP_CLK
21 = DQSY
22 = SRDT
23 = GND
NOT ON ALL VERSIONS
1800
1 = TRACK-
2 = FOCUS -
3 = FOCUS +
4 = TRACK +
5 = LASER (cathode)
6 = LASER (anode)
7 = DIODE ARRAY (common cathode)
8 = D1
9 = D2
10 = D3
11 = D5
12 = D4
1
6
1801
1 = SLIDE MOTOR -
2 = SLIDE MOTOR +
3 = DISC MOTOR -
4 = DISC MOTOR +
5 = INNER SWITCH
6 = INNER SWITCH
FLEX - FOIL
NOT ON ALL VERSIONS
2
1
1806
23
CONNECTOR BOARD
9
1
6
1
1
3
2
4
1
3
1874
1873
1808
1860
1 = SWITCH INFO
2 = STR_OUT
3 = SHR_CL
4 = PORE
5 = DATA
6 = SILD
7 = GND
8 = SICL
9 = OE_LATCH
1 = CD LEFT
2 = GNDA
3 = CD RIGHT
4 = +5V
5 = GND
6 = +10V
SHIELDING/KILL/EBUGND
COAX2/KILLR/EBUOUT
COAX1/IREF/+5V
1 = µP_CLK
2 = GND
3 = SRDT
4 = DQSY
NOT ON ALL VERSIONS
FLEX
6 WHITE
5 BLUE
SLEDGE MOTOR
CD Drive
1 BLACK
2 ORANGE
INNER SWITCH
DISC MOTO R
3 GREEN
4 YELLOW

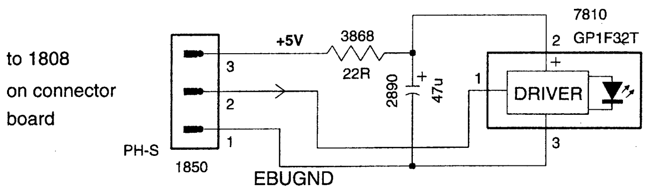
Remarks

Connector Board Copperside view

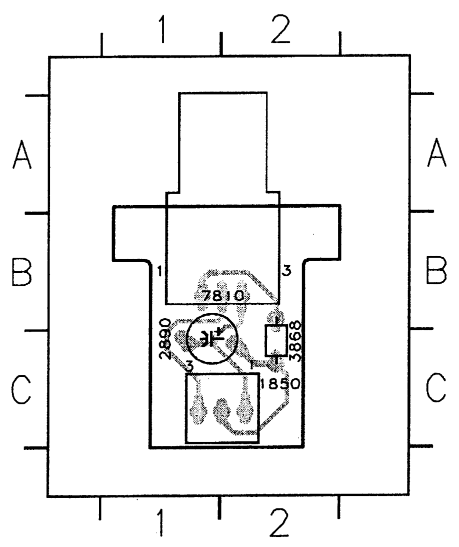
1806	A2	1873	B2	2883	B1	9894	A1
1808	B1	1874	B3	9851	A3	9895	A2
1860	B1	2868	B2	9878	B3	MP894	A1


1
2
3
4
A
B
22
1806
2
9894
MP894
23
9895
2883
9851
2868
9878
DQSY
GND
1860
4
2
3
1808
1
1873
6
1874
1
9
3
1
SRDT
CLK
C/I/+
C/K/E
S/E/K
LEFT
GND
RIGHT
+5V
GND
+10V
SW_INF
STR_OUT
SHR_CL
PORE
DATA
SILD
GND
SICL
OE_LAT

Circuit Diagram Optical out


to 1808
on connector
board
PH-S
1850
3
2
1
+5V
3868
22R
2890
47u
7810
GP1F32T
2
1
3
DRIVER
EBUGND

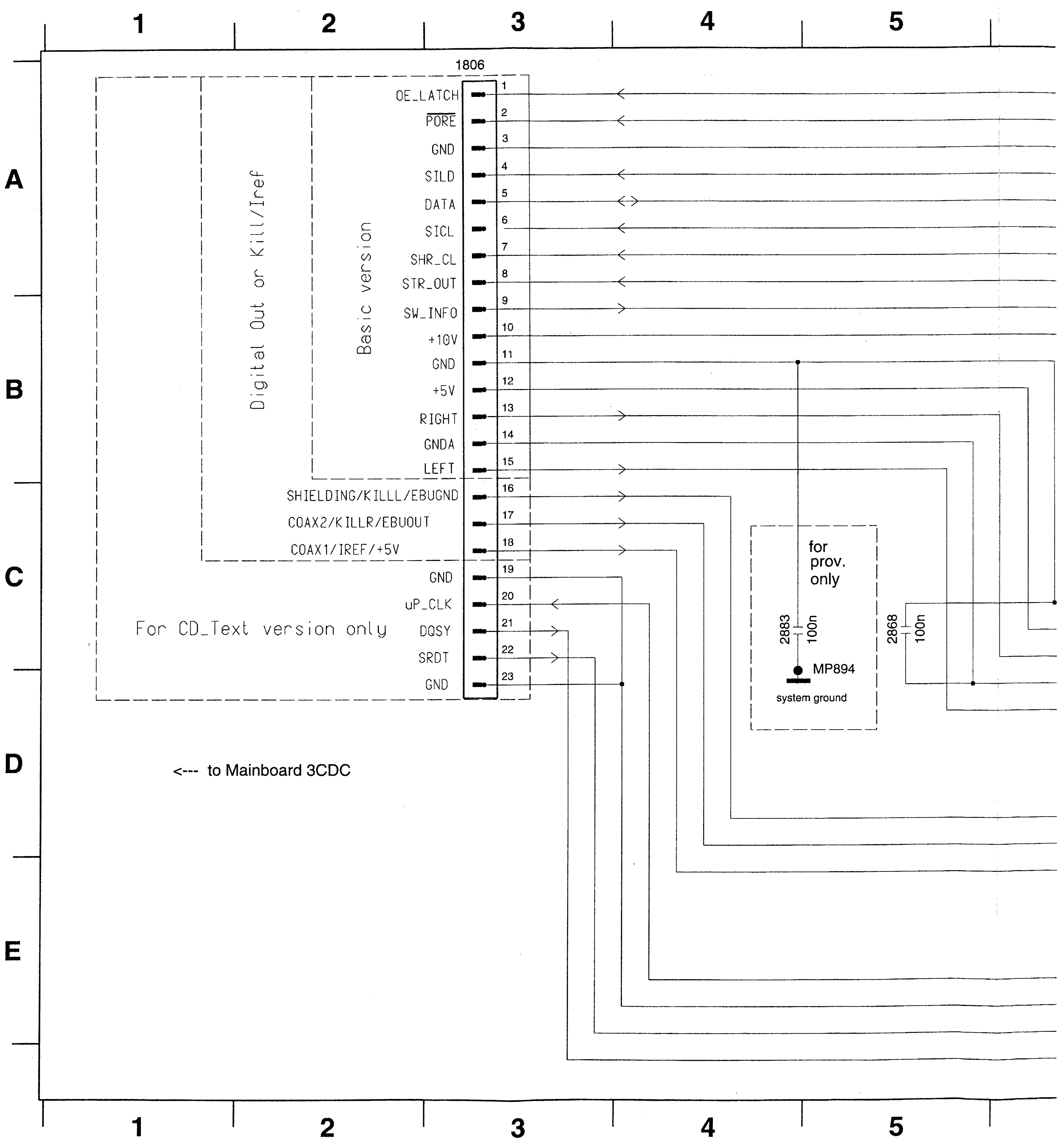
Component Layout Optical out


1
2
A
B
C
1
3
7810
2890
3868
3
1850

1850	C2
2890	C1
3868	C2
7810	B1

Circuit diagram Connector Board

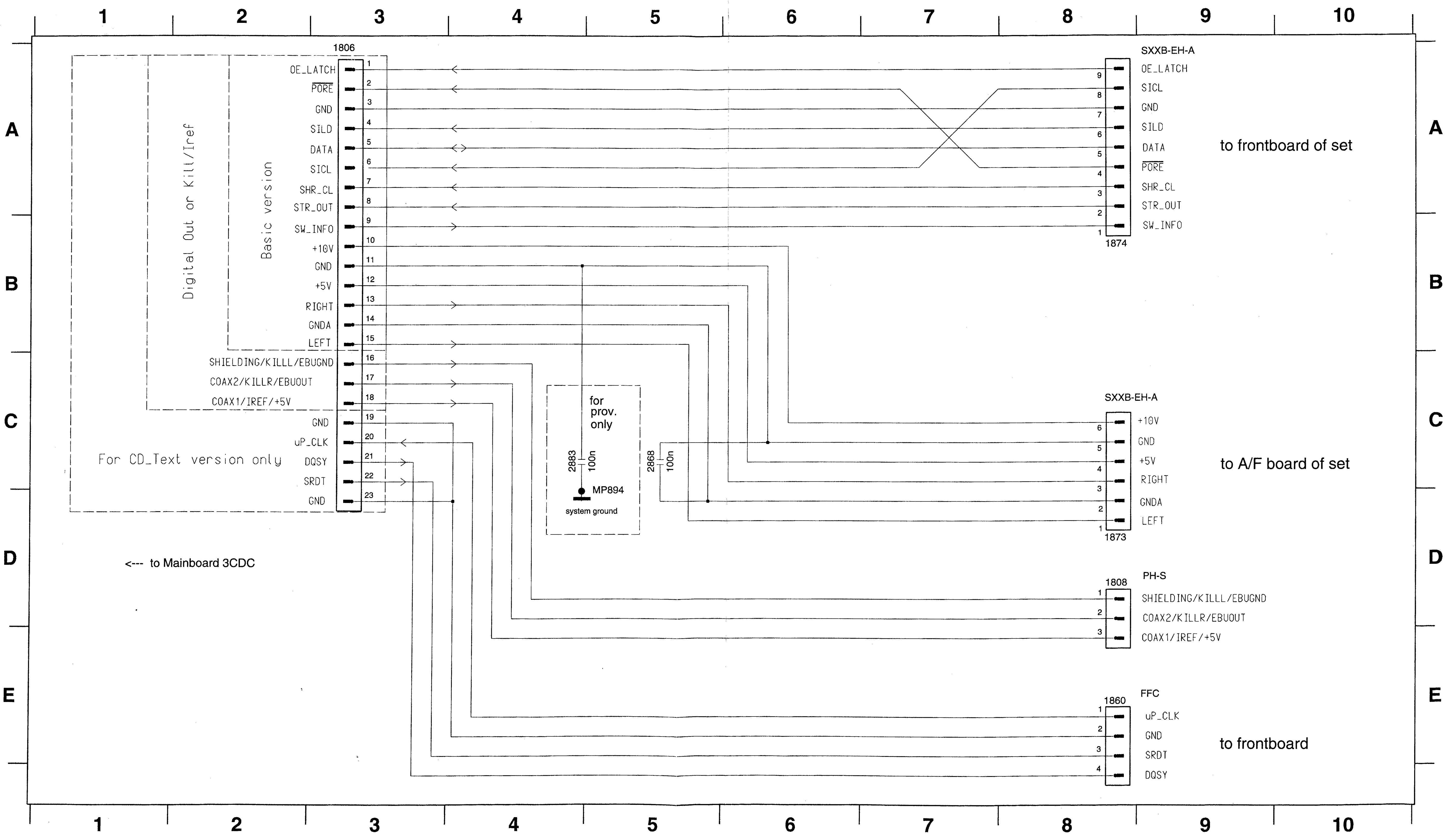
1806	A3	1860	E8	1874	B8	2883	C4
1808	D8	1873	D8	2868	C5		


1
2
3
4
5
A
B
C
D
E
1806
OE_LATCH
PORE
GND
SILD
DATA
SICL
SHR_CL
STR_OUT
SW_INFO
+10V
GND
+5V
RIGHT
GNDA
LEFT
SHIELDING/KILLL/EBUGND
COAX2/KILLR/EBUOUT
COAX1/IREF/+5V
GND
uP_CLK
DQSY
SRDT
GND
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
Digital Out or Kill/Iref
Basic version
For CD_Text version only
<--- to Mainboard 3CDC
for
prov.
only
2883
100n
MP894
system ground
2868
100n

Circuit diagram Connector Board

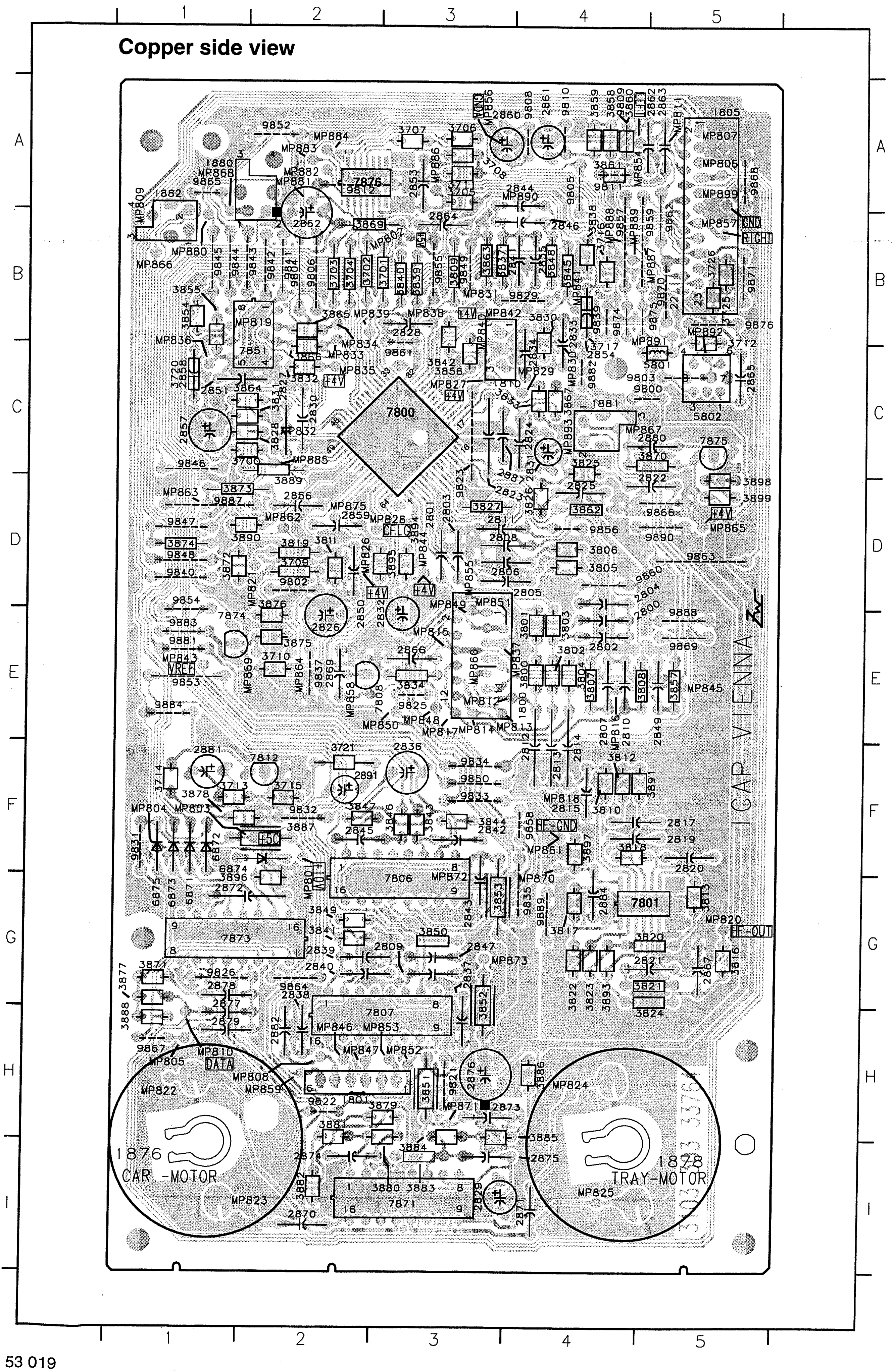
1806	A3	1860	E8	1874	B8	2883	C4
1808	D8	1873	D8	2868	C5		

1850	C2
2890	C1
3868	C2
7810	B1


1 2 3 4 5 6 7 8 9 10
A B C D E
1806
OE_LATCH
PORE
GND
SILD
DATA
SICL
SHR_CL
STR_OUT
SW_INFO
+10V
GND
+5V
RIGHT
GNDA
LEFT
SHIELDING/KILLL/EBUGND
COAX2/KILLR/EBUOUT
COAX1/IREF/+5V
GND
uP_CLK
DQSY
SRDT
GND
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Digital Out or Kill/Iref
Basic version
For CD_Text version only
<--- to Mainboard 3CDC
for prov. only
2883 100n
MP894
system ground
2868 100n
SXXB-EH-A
1874
OE_LATCH
SICL
GND
SILD
DATA
PORE
SHR_CL
STR_OUT
SW_INFO
to frontboard of set
SXXB-EH-A
1873
+10V
GND
+5V
RIGHT
GNDA
LEFT
to A/F board of set
PH-S
1808
SHIELDING/KILLL/EBUGND
COAX2/KILLR/EBUOUT
COAX1/IREF/+5V
FFC
1860
uP_CLK
GND
SRDT
DQSY
to frontboard

NOT ON ALL VERSIONS

Copper side view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7800
7806
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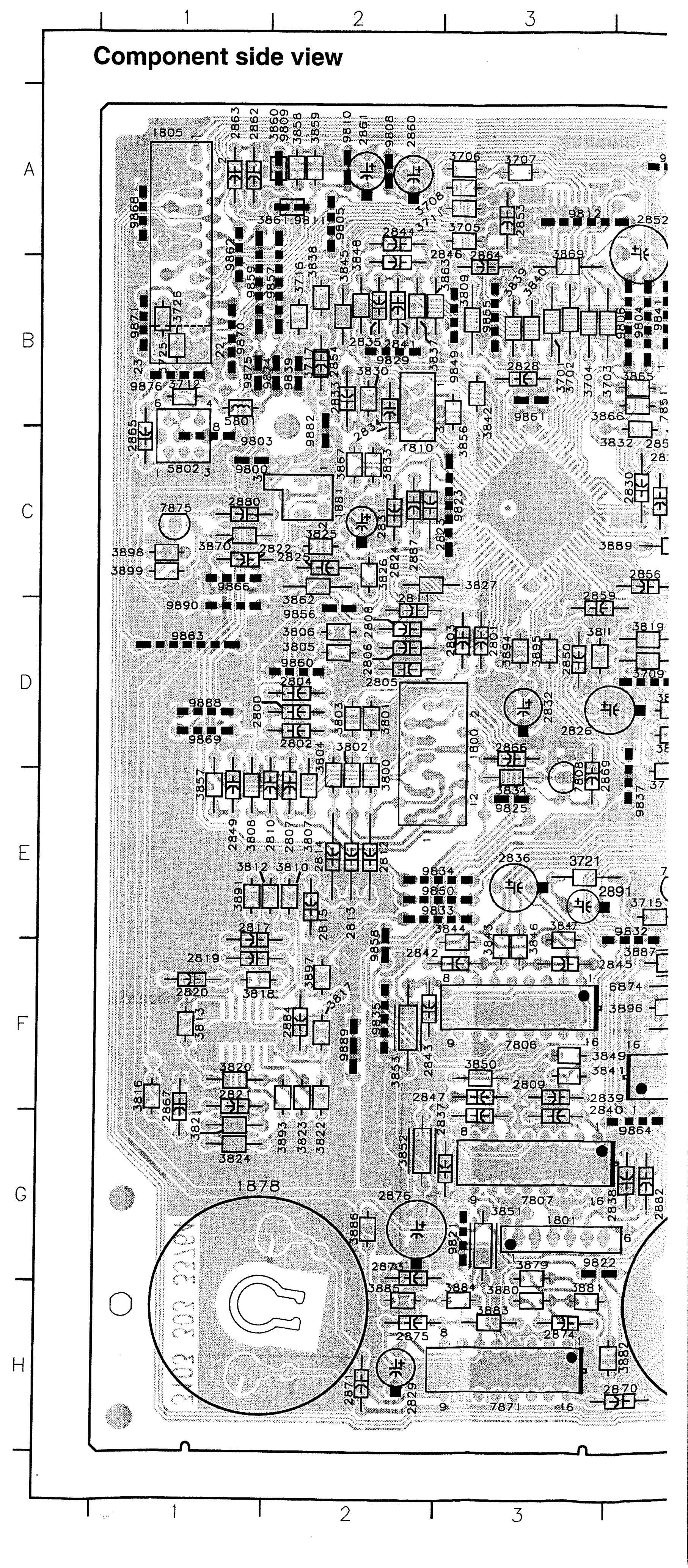
7871
7873
7801
7876
7851
1805
1876
1878
CAR.-MOTOR
TRAY-MOTOR
ICAP VIENNA
GND
RIGHT
HF-OUT
HF-GND
DATA
VREF
+4V
+5V
MP807
MP806
MP899
MP857
MP824
MP825
MP822
MP823

CS 53 019

1800	E3	2869	E2	3841	G2	7874	E1
1801	H2	2870	I2	3842	B3	7875	C5
1805	B5	2871	I4	3843	F3	9800	C4
1810	C3	2872	G2	3844	F3	9802	D2
1876	I1	2873	H3	3845	B4	9803	C5
1878	I4	2874	I2	3846	F3	9804	B2
1880	B2	2875	I3	3847	F2	9805	A4
1881	C4	2876	H3	3848	B4	9806	B2
1882	B1	2877	G1	3849	G2	9808	A4
2800	D4	2878	G1	3850	G3	9809	A4
2801	D3	2879	H1	3851	H3	9810	A4
2802	E4	2880	C5	3852	G3	9811	A4
2803	D3	2881	F1	3853	G3	9812	A2
2804	D4	2882	H2	3854	B1	9821	H3
2805	D3	2884	G4	3855	B1	9822	H2
2806	D3	2887	C3	3856	C3	9823	C3
2807	E4	3700	C1	3857	E5	9825	E3
2808	D3	3701	B3	3858	A4	9826	G1
2809	G3	3702	B2	3859	A4	9829	B4
2810	E4	3703	B2	3860	A4	9831	F1
2811	D3	3704	B2	3861	A4	9832	F2
2812	F4	3705	A3	3862	D4	9833	F3
2813	F4	3706	A3	3863	B3	9834	F3
2814	F4	3707	A3	3864	C1	9835	G4
2815	F4	3708	A3	3865	B2	9837	E2
2817	F4	3709	D2	3866	C2	9839	B4
2819	F4	3710	E2	3867	C4	9840	D1
2820	F5	3711	A3	3869	B2	9841	B2
2821	G5	3712	B5	3870	C5	9842	B2
2822	D5	3713	F1	3871	G1	9843	B2
2823	C3	3714	F1	3872	D1	9844	B1
2824	C4	3715	F2	3873	D1	9845	B1
2825	D4	3716	B4	3874	D1	9846	C1
2826	D2	3717	B4	3875	E2	9847	D1
2827	C2	3720	C1	3876	E2	9848	D1
2828	B3	3725	B5	3877	G1	9849	B3
2829	I3	3726	B5	3878	F2	9850	F3
2830	C2	3800	E4	3879	H3	9852	A2
2831	C4	3801	E4	3880	H3	9853	E1
2832	E3	3802	E4	3881	H2	9854	D1
2833	B4	3803	E4	3882	I2	9855	B3
2834	C3	3804	E4	3883	I3	9856	D4
2835	B4	3805	D4	3884	H3	9857	B4
2836	F3	3806	D4	3885	H3	9858	F4
2837	H3	3807	E4	3886	H4	9859	B4
2838	H2	3808	E4	3887	F2	9860	D4
2839	G2	3809	B3	3888	H1	9861	B3
2840	G2	3810	F4	3889	C2	9862	B5
2841	B3	3811	D2	3890	D1	9863	D5
2842	F3	3812	F4	3891	F4	9864	G2
2843	G3	3813	G5	3893	G4	9865	A1
2844	B4	3816	G5	3894	D3	9866	D5
2845	F2	3817	G4	3895	D3	9867	H1
2846	B4	3818	F4	3896	G2	9868	A5
2847	G3	3819	D2	3897	F4	9869	E5
2849	E5	3820	G5	3898	D5	9870	B5
2850	D2	3821	G5	3899	D5	9871	B5
2851	C1	3822	G4	5801	B5	9874	B4
2852	A2	3823	G4	5802	C5	9875	B4
2853	A3	3824	G5	6871	F1	9876	B5
2854	B4	3825	C4	6872	F1	9881	E1
2856	D2	3826	D4	6873	F1	9882	C4
2857	C1	3827	D3	6874	F2	9883	E1
2858	C1	3828	C1	6875	F1	9884	E1
2859	D2	3830	B4	7800	C2	9887	D1
2860	A3	3831	C1	7801	G4	9888	E5
2861	A4	3832	C2	7806	G3	9889	G4
2862	A4	3833	C4	7807	H3	9890	D5
2863	A5	3834	E3	7808	E2		
2864	B3	3837	B3	7812	F2		
2865	C5	3838	B4	7851	B2		
2866	E3	3839	B3	7871	I3		
2867	G5	3840	B3	7873	G1		

Component side view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A
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G
H
1805
1878
1801
7806
7807
7871
5802
580

1800	E3
1801	H2
1805	B5
1810	C3
1876	I1
1878	I4
1880	B2
1881	C4
1882	B1
2800	D4
2801	D3
2802	E4
2803	D3
2804	D4
2805	D3
2806	D3
2807	E4
2808	D3
2809	G3
2810	E4
2811	D3
2812	F4
2813	F4
2814	F4
2815	F4
2817	F4
2819	F4
2820	F5
2821	G5
2822	D5
2823	C3
2824	C4
2825	D4
2826	D2
2827	C2
2828	B3
2829	I3
2830	C2
2831	C4
2832	E3
2833	B4
2834	C3
2835	B4
2836	F3
2837	H3
2838	H2
2839	G2
2840	G2
2841	B3
2842	F3
2843	G3
2844	B4
2845	F2
2846	B4
2847	G3
2849	E5
2850	D2
2851	C1
2852	A2
2853	A3
2854	B4
2856	D2
2857	C1
2858	C1
2859	D2
2860	A3
2861	A4
2862	A4
2863	A5
2864	B3
2865	C5
2866	E3
2867	G5
2869	E2
2870	I2
2871	I4
2872	G2
2873	H3
2874	I2
2875	I3
2876	H3
2877	G1
2878	G1
2879	H1
2880	C5
2881	F1
2882	H2
2884	G4
2887	C3
3700	C1
3701	B3
3702	B2
3703	B2
3704	B2
3705	A3
3706	A3
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3708	A3
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3711	A3
3712	B5
3713	F1
3714	F1
3715	F2
3716	B4
3717	B4
3720	C1
3725	B5
3726	B5
3800	E4
3801	E4
3802	E4
3803	E4
3804	E4
3805	D4
3806	D4
3807	E4
3808	E4
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3825	C4
3826	D4
3827	D3
3828	C1
3830	B4
3831	C1
3832	C2
3833	C4
3834	E3
3837	B3
3838	B4
3839	B3
3840	B3
3841	G2
3842	B3
3843	F3
3844	F3
3845	B4
3846	F3
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3849	G2
3850	G3
3851	H3
3852	G3
3853	G3
3854	B1
3855	B1
3856	C3
3857	E5
3858	A4
3859	A4
3860	A4
3861	A4
3862	D4
3863	B3
3864	C1
3865	B2
3866	C2
3867	C4
3869	B2
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3899	D5
5801	B5
5802	C5
6871	F1
6872	F1
6873	F1
6874	F2
6875	F1
7800	C2
7801	G4
7806	G3
7807	H3
7808	E2
7812	F2
7851	B2
7871	I3
7873	G1
7874	E1
7875	C5
9800	C4
9802	D2
9803	C5
9804	B2
9805	A4
9806	B2
9808	A4
9809	A4
9810	A4
9811	A4
9812	A2
9821	H3
9822	H2
9823	C3
9825	E3
9826	G1
9829	B4
9831	F1
9832	F2
9833	F3
9834	F3
9835	G4
9837	E2
9839	B4
9840	D1
9841	B2
9842	B2
9843	B2
9844	B1
9845	B1
9846	C1
9847	D1
9848	D1
9849	B3
9850	F3
9852	A2
9853	E1
9854	D1
9855	B3
9856	D4
9857	B4
9858	F4
9859	B4
9860	D4
9861	B3
9862	B5
9863	D5
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9866	D5
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9868	A5
9869	E5
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9874	B4
9875	B4
9876	B5
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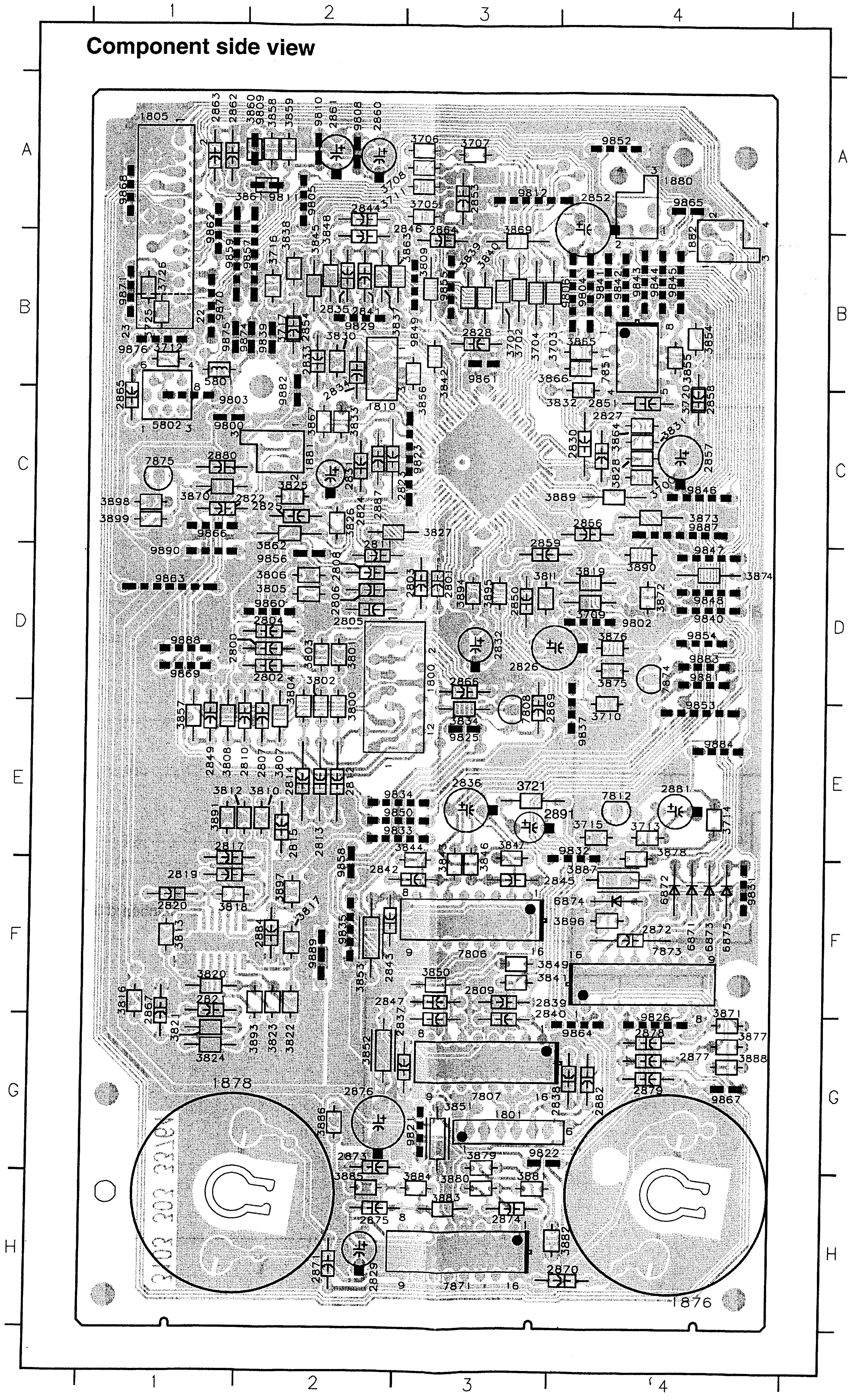
9884	E1
9887	D1
9888	E5
9889	G4
9890	D5



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1876	H4
1878	H1
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1881	C2
1882	B4
2800	D2
2801	D3
2802	D2
2803	D3
2804	D2
2805	D2
2806	D2
2807	E2
2808	D2
2809	F3
2810	E2
2811	D2
2812	E2
2813	E2
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2819	F1
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2854	B2
2856	C4
2857	C4
2858	C4
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2861	A2
2862	A1
2863	A1
2864	B3
2865	C1
2866	E3
2867	F1
2869	E3
2870	H4
2871	H2
2872	F4
2873	G2
2874	H3
2875	H2
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2880	C1
2881	E4
2882	G4
2884	F2
2887	C2
3700	C4
3701	B3
3702	B3
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3704	B3
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3707	A3
3708	A3
3709	D4
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3712	B1
3713	E4
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3715	E4
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3800	E2
3801	D2
3802	E2
3803	D2
3804	E2
3805	D2
3806	D2
3807	E2
3808	E1
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3811	D3
3812	E2
3813	F1
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3831	C4
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3851	G3
3852	G2
3853	F2
3854	B4
3855	B4
3856	B3
3857	E1
3858	A2
3859	A2
3860	A2
3861	A2
3862	C2
3863	B2
3864	C4
3865	B4
3866	B4
3867	C2
3869	B3
3870	C1
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3873	C4
3874	D4
3875	D4
3876	D4
3877	G4
3878	E4
3879	G3
3880	H3
3881	H3
3882	H4
3883	H3
3884	H3
3885	H2
3886	G2
3887	F4
3888	G4
3889	C4
3890	D4
3891	E1
3893	F2
3894	D3
3895	D3
3896	F4
3897	F2
3898	C1
3899	C1
5801	B1
5802	C1
6871	F4
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6874	F4
6875	F4
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7812	E4
7851	B4
7871	H3
7873	F4
7874	D4
7875	C1
9800	C1
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9803	C1
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9809	A2
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9822	G3
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9842	B4
9843	B4
9844	B4
9845	B4
9846	C4
9847	D4
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9856	D2
9857	B2
9858	F2
9859	B1
9860	D2
9861	B3
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9869	D1
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9874	B2
9875	B1
9876	B1
9881	D4
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9887	C4
9888	D1
9889	F2
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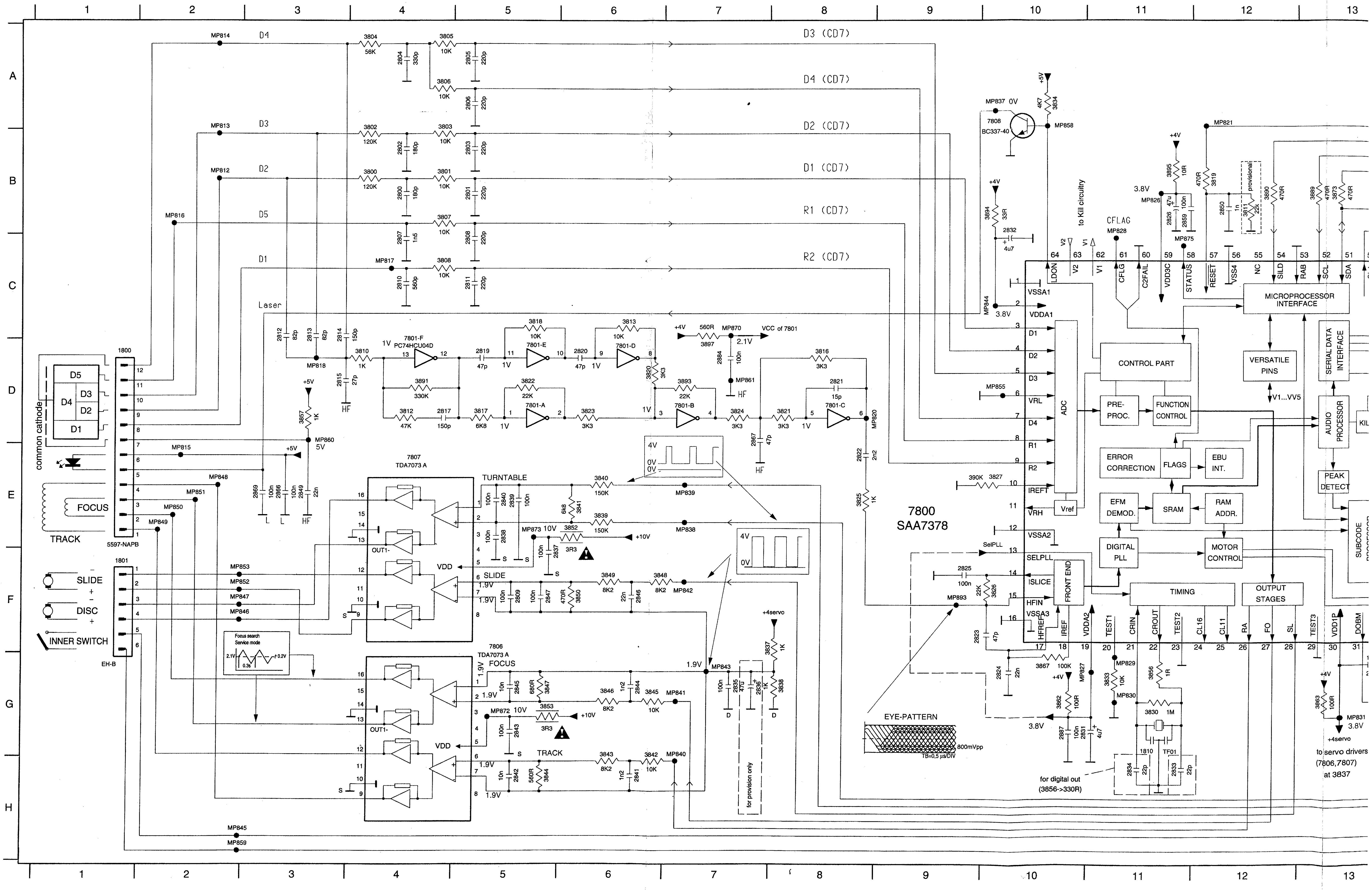
Circuit Diagram Main Board part1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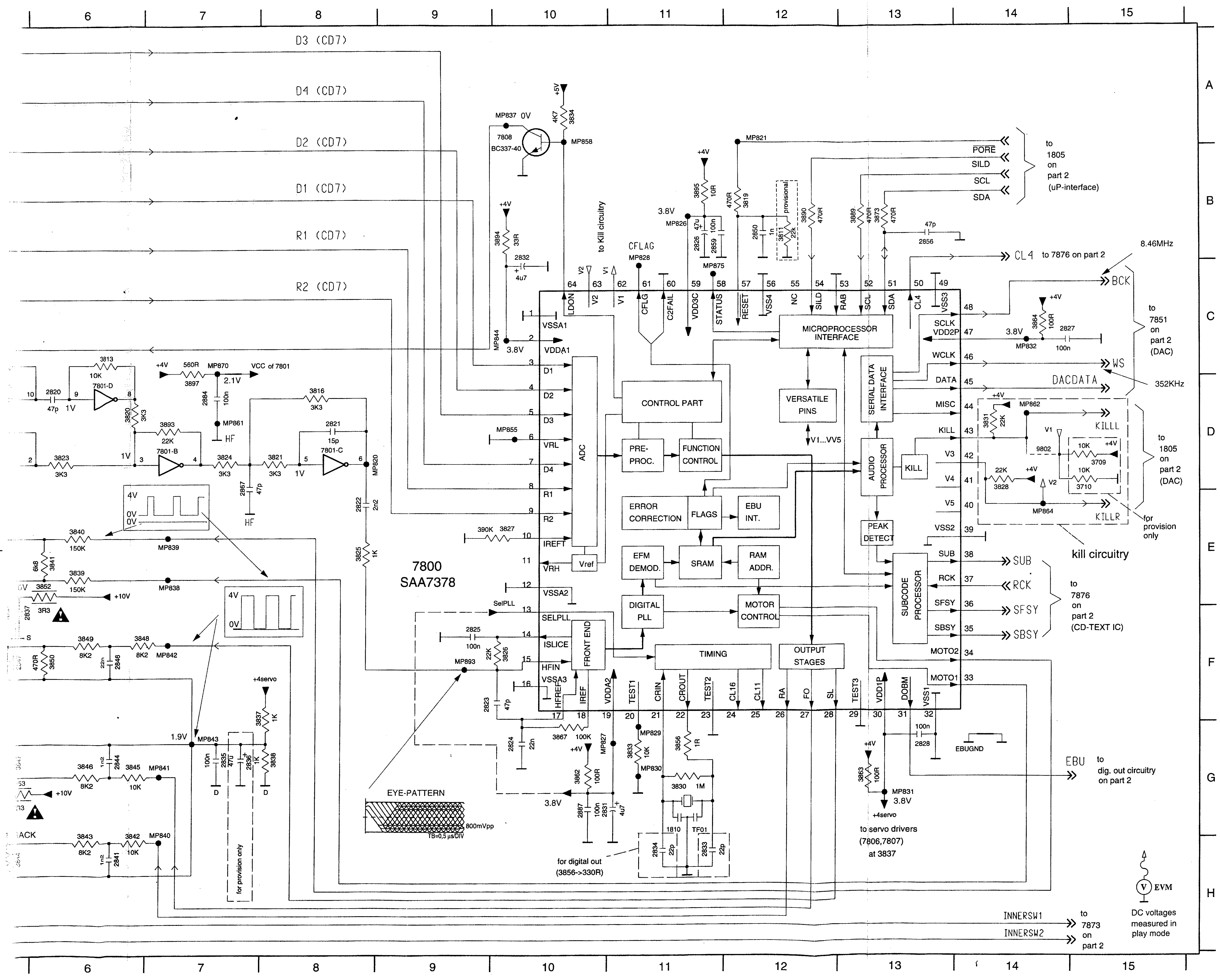
12
13
A
B
C
D
E
F
G
H
MP814
D4
MP813
D3
MP812
D2
MP816
D5
D1
3804
56K
3805
10K
2804
330p
2805
220p
3806
10K
2806
220p
3802
120K
3803
10K
2802
180p
2803
220p
3800
120K
3801
10K
2800
180p
2801
220p
3807
10K
2807
1n5
2808
220p
MP817
3808
10K
2810
560p
2811
220p
D3 (CD7)
D4 (CD7)
D2 (CD7)
D1 (CD7)
R1 (CD7)
R2 (CD7)
Laser
1800
D5
D4
D3
D2
D1
common cathode
FOCUS
TRACK
5597-NAPB
MP815
MP848
MP851
MP850
MP849
+5V
MP860
5V
3857
1K
2812
82p
2813
82p
2814
150p
MP818
3810
1K
2815
27p
HF
1V
7801-F
PC74HCU04D
2819
47p
3818
10K
7801-E
2820
47p
3813
10K
7801-D
3820
3K3
3891
330K
3822
22K
7801-A
3812
47K
2817
150p
3817
6K8
3823
3K3
3893
22K
7801-B
3824
3K3
3821
3K3
2821
15p
7801-C
3816
3K3
MP820
2867
47p
2822
2n2
3825
1K
+4V
560R
3897
MP870
VCC of 7801
2.1V
2884
100n
MP861
2869
100n
2866
100n
2849
100n
2848
22n
7807
TDA7073 A
TURNTABLE
3840
150K
MP839
2840
100n
2839
100n
3841
6K8
3839
150K
MP838
MP873
10V
3852
3R3
+10V
2838
2837
OUT1-
VDD
SLIDE
1.9V
2809
2847
3850
470R
3849
8K2
2846
22n
3848
8K2
MP842
4V
0V
1801
SLIDE
DISC
INNER SWITCH
EH-B
MP853
MP852
MP847
MP846
Focus search
Service mode
2.1V
0.2V
0.3s
7806
TDA7073 A
FOCUS
2845
3847
680R
3846
8K2
2844
1n2
3845
10K
MP841
MP872
10V
3853
3R3
2843
TRACK
2842
3844
560R
3843
8K2
2841
1n2
3842
10K
MP840
MP843
1.9V
2835
2836
3837
1K
3838
+4servo
for provision only
MP845
MP859
EYE-PATTERN
800mVpp
TB=0,5 µs/DIV
7800
SAA7378
MP837 0V
7808
BC337-40
+5V
3834
4K7
MP858
+4V
3894
33R
2832
4u7
MP844
3.8V
to Kill circuitry
V2
V1
CFLAG
MP828
3.8V
MP826
2826
47u
2859
100n
3895
10R
MP875
3819
470R
MP821
2850
1n
3811
22K
provisional
3890
470R
3889
470R
3873
470R
64
63
62
61
60
59
58
57
56
55
54
53
52
51
LDON
V2
V1
CFLG
C2FAIL
VDD3C
STATUS
RESET
VSS4
NC
SILD
RAB
SCL
SDA
VSSA1
VDDA1
D1
D2
D3
VRL
D4
R1
R2
IREFT
VRH
VSSA2
SELPLL
ISLICE
HFIN
VSSA3
MP855
390K
3827
SelPLL
2825
100n
3826
22K
MP893
2823
47p
ADC
Vref
CONTROL PART
PRE-PROC.
FUNCTION CONTROL
ERROR CORRECTION
FLAGS
EBU INT.
EFM DEMOD.
SRAM
RAM ADDR.
DIGITAL PLL
MOTOR CONTROL
FRONT END
TIMING
OUTPUT STAGES
MICROPROCESSOR INTERFACE
VERSATILE PINS
V1...VV5
SERIAL DATA INTERFACE
AUDIO PROCESSOR
PEAK DETECT
SUBCODE
KIL
HFREF
IREF
VDDA2
TEST1
CRIN
CROUT
TEST2
CL16
CL11
RA
FO
SL
TEST3
VDD1P
DOBM
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
3867
100K
2824
22n
MP827
3862
100R
2887
100n
2831
4u7
3833
10K
MP829
MP830
3856
1R
3830
1M
1810
TF01
2834
22p
2833
22p
for digital out
(3856->330R)
3863
100R
MP831
3.8V
+4servo
to servo drivers
(7806,7807)
at 3837


6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
D3 (CD7)
D4 (CD7)
D2 (CD7)
D1 (CD7)
R1 (CD7)
R2 (CD7)
+5V
4K7
3834
MP858
MP837 0V
7808
BC337-40
+4V
3894
33R
2832
4u7
MP844
3.8V
to Kill circuitry
V2
V1
CFLAG
MP828
3.8V
MP826
+4V
3895
10R
2826
47u
2859
100n
MP875
MP821
470R
3819
2850
1n
3811
22K
provisional
3890
470R
3889
470R
3873
470R
47p
2856
PORE
SILD
SCL
SDA
to 1805 on part 2 (uP-interface)
CL4
to 7876 on part 2
8.46MHz
BCK
to 7851 on part 2 (DAC)
+4V
3864
100R
2827
100n
3.8V
MP832
WS
DACDATA
352KHz
64
63
62
61
60
59
58
57
56
55
54
53
52
51
50
49
LDON
V2
V1
CFLG
C2FAIL
VDD3C
STATUS
RESET
VSS4
NC
SILD
RAB
SCL
SDA
CL4
VSS3
VSSA1
VDDA1
D1
D2
D3
VRL
D4
R1
R2
IREFT
VRH
VSSA2
SELPLL
ISLICE
HFIN
VSSA3
HFREF
IREF
VDDA2
TEST1
CRIN
CROUT
TEST2
CL16
CL11
RA
FO
SL
TEST3
VDD1P
DOBM
VSS1
MOTO1
MOTO2
SBSY
SFSY
RCK
SUB
VSS2
V5
V4
V3
KILL
MISC
DATA
WCLK
SCLK VDD2P
48
47
46
45
44
43
42
41
40
39
38
37
36
35
34
33
1
2
3
4
5
6
7
8
9
10
11
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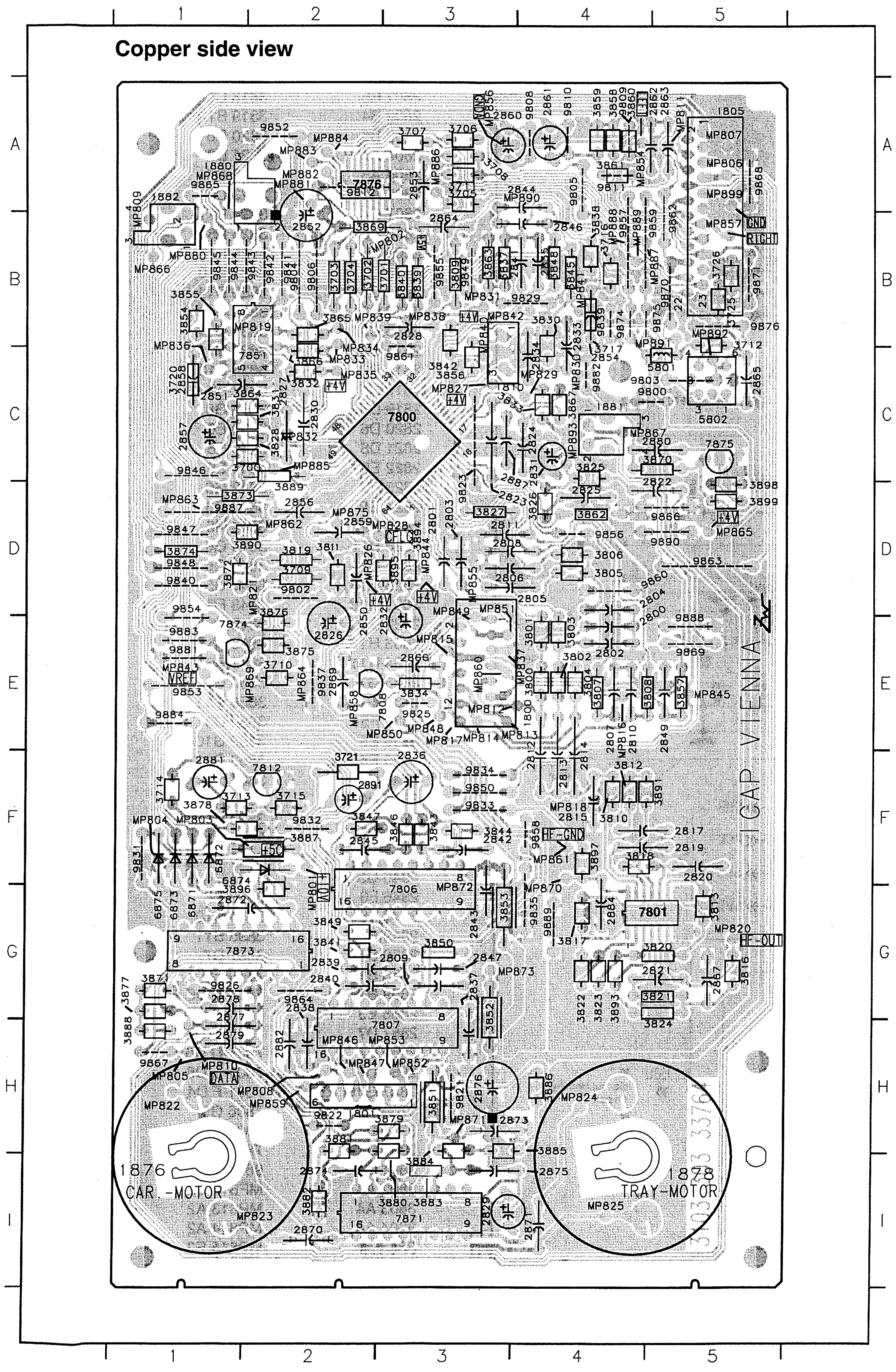
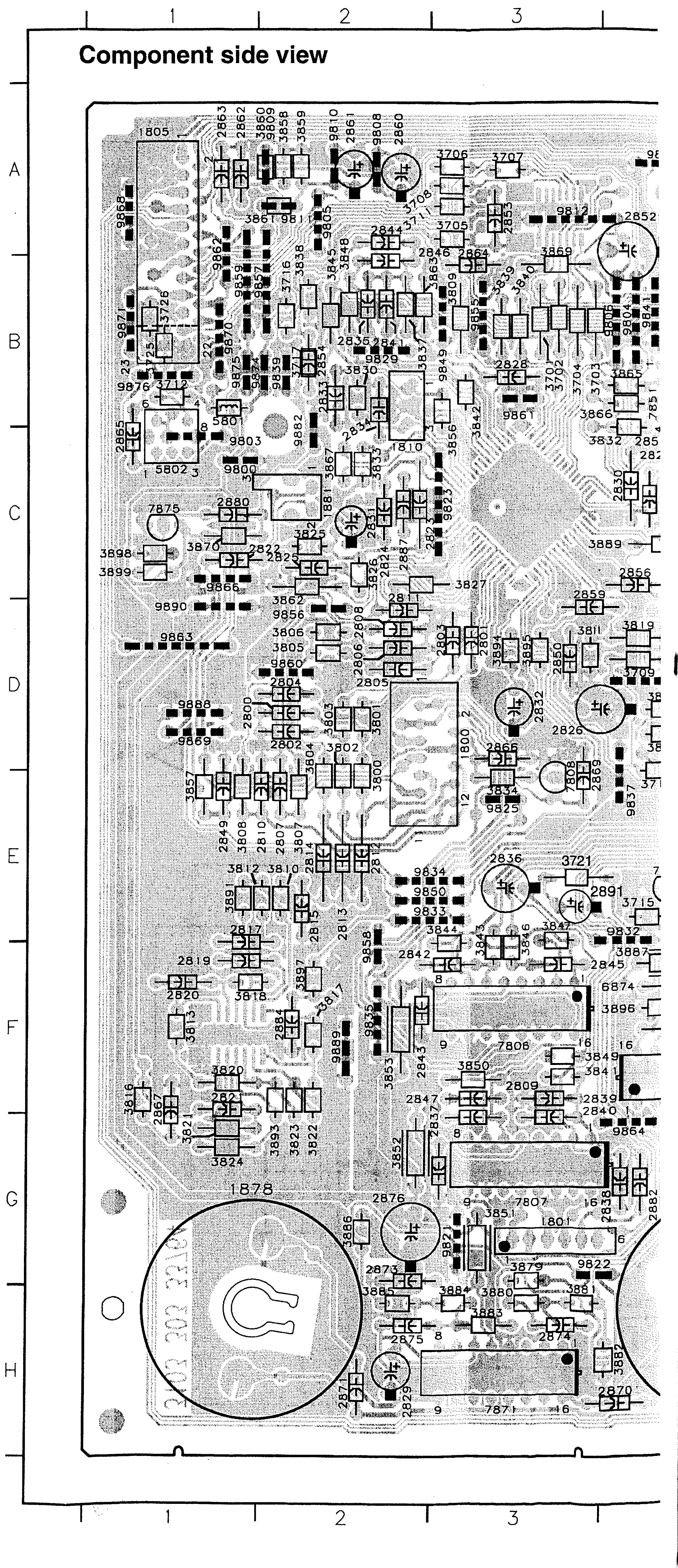
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
ADC
Vref
CONTROL PART
PRE-PROC.
FUNCTION CONTROL
ERROR CORRECTION
FLAGS
EBU INT.
EFM DEMOD.
SRAM
RAM ADDR.
DIGITAL PLL
MOTOR CONTROL
FRONT END
TIMING
OUTPUT STAGES
MICROPROCESSOR INTERFACE
VERSATILE PINS
V1...VV5
SERIAL DATA INTERFACE
AUDIO PROCESSOR
KILL
PEAK DETECT
SUBCODE PROCESSOR
7800
SAA7378
+4V
3831
22K
MP862
V1
9802
10K
+4V
3709
10K
3710
22K
+4V
3828
V2
MP864
KILLL
KILLR
to 1805 on part 2 (DAC)
for provision only
kill circuitry
SUB
RCK
SFSY
SBSY
to 7876 on part 2 (CD-TEXT IC)
3813
10K
10
2820
47p
1V
9
7801-D
8
3820
3K3
+4V
560R
3897
MP870
VCC of 7801
2.1V
2884
100n
MP861
HF
3816
3K3
3893
22K
7801-B
2
3823
3K3
1V
3
4
3824
3K3
3821
3K3
5
1V
2821
15p
7801-C
6
MP820
2867
47p
HF
2822
2n2
3825
1K
MP855
390K
3827
4V
0V
0V
3840
150K
MP839
6K8
3841
3839
150K
MP838
3852
3R3
2837
+10V
3849
8K2
3848
8K2
MP842
470R
3850
22n
2846
S
4V
0V
SelPLL
2825
100n
22K
3826
MP893
2823
47p
2824
22n
3867
100K
+4V
3862
100R
MP827
3.8V
2887
100n
2831
4u7
3833
10K
MP829
MP830
3856
1R
3830
1M
1810
TF01
2834
22p
2833
22p
for digital out (3856->330R)
EYE-PATTERN
800mVpp
TB=0,5 µs/DIV
+4servo
3837
1K
3838
1K
1.9V
MP843
2835
100n
470
2836
D
D
for provision only
1n2
2844
3846
8K2
3845
10K
MP841
+10V
ACK
3843
8K2
1n2
2841
3842
10K
MP840
100n
2828
EBUGND
+4V
3863
100R
MP831
3.8V
+4servo
to servo drivers (7806,7807) at 3837
EBU
to dig. out circuitry on part 2
INNERSW1
INNERSW2
to 7873 on part 2
EVM
DC voltages measured in play mode

1800	D1
1801	F1
1810	G11
2800	B4
2801	B5
2802	B4
2803	B5
2804	A4
2805	A5
2806	A5
2807	C4
2808	C5
2809	F5
2810	C4
2811	C5
2812	C3
2813	C3
2814	C3
2815	D3
2817	D4
2819	D5
2820	D6
2821	D8
2822	E8
2823	F9
2824	G9
2825	F9
2826	B11
2827	C14
2828	G13
2831	G10
2832	B10
2833	H11
2834	H11
2835	G7
2836	G7
2837	F5
2838	E5
2839	E5
2840	E5
2841	H6
2842	H5
2843	G5
2844	G6
2845	G5
2846	F6
2847	F5
2849	E3
2850	B12
2856	B13
2859	B11
2866	E3
2867	D7
2869	E3
2884	D7
2887	G10
3709	D15
3710	D15
3800	B4
3801	B4
3802	A4
3803	A4
3804	A4
3805	A4
3806	A4
3807	B4
3808	C4
3810	D4
3811	B12
3812	D4
3813	C6
3816	D8
3817	D5
3818	C5
3819	B12
3820	D6
3821	D8
3822	D5
3823	D6
3824	D7
3825	E8
3826	F10
3827	E10
3828	D14
3830	G11
3831	D14
3833	G11
3834	B10
3837	F8
3838	G8
3839	E6
3840	E6
3841	E6
3842	G6
3843	G6
3844	H5
3845	G6
3846	G6
3847	G5
3848	F6
3849	F6
3850	F6
3852	E6
3853	G5
3856	G11
3857	D3
3862	G10
3863	G13
3864	C14
3867	G10
3873	B13
3889	B13
3890	B12
3891	D4
3893	D7
3894	B10
3895	B11
3897	D7
7800	E9
7801-A	D5
7801-B	D7
7801-C	D8
7801-D	D6
7801-E	D5
7801-F	D4
7806	G5
7807	E4
7808	B10
9802	D14
MP812	B2
MP813	A2
MP814	A2
MP815	E2
MP816	B2
MP817	C4
MP818	D3
MP820	D8
MP821	B12
MP826	B11
MP827	G10
MP828	B11
MP829	G11
MP830	G11
MP831	G13
MP832	C14
MP837	B10
MP838	E6
MP839	E6
MP840	G7
MP841	G7
MP842	F7
MP843	G7
MP844	C10
MP845	H3
MP846	F2
MP847	F2
MP848	E2
MP849	E2
MP850	E2
MP851	E2
MP852	F2
MP853	F2
MP855	D10
MP858	B10
MP859	H3
MP860	D3
MP861	D7
MP862	D14
MP864	E14
MP870	C7
MP872	G5
MP873	E5
MP875	C11
MP893	F9



Copper side view

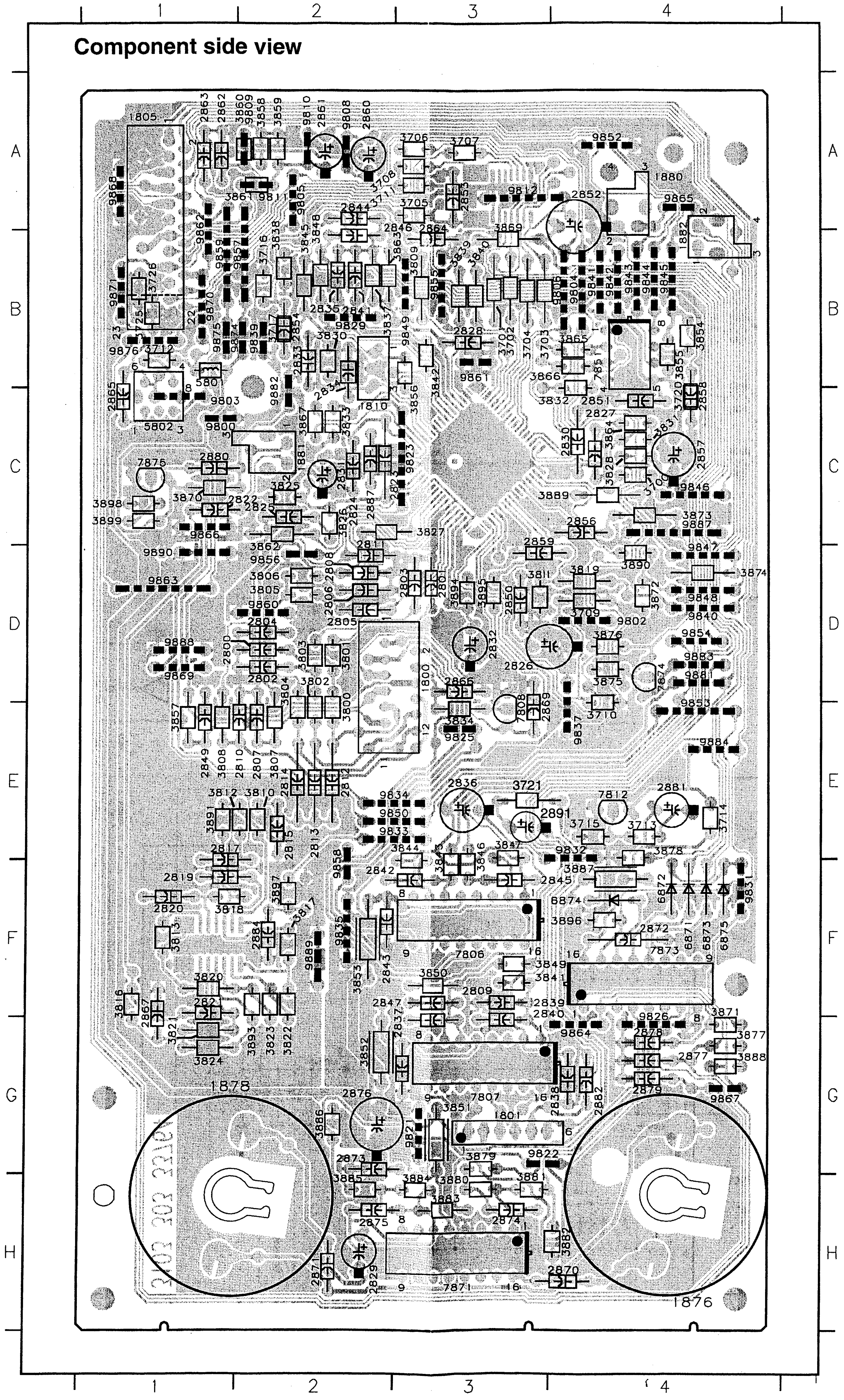
1800	E3
1801	H2
1805	B5
1810	C3
1876	I1
1878	I4
1880	B2
1881	C4
1882	B1
2800	D4
2801	D3
2802	E4
2803	D3
2804	D4
2805	D3
2806	D3
2807	E4
2808	D3
2809	G3
2810	E4
2811	D3
2812	F4
2813	F4
2814	F4
2815	F4
2817	F4
2819	F4
2820	F5
2821	G5
2822	D5
2823	C3
2824	C4
2825	D4
2826	D2
2827	C2
2828	B3
2829	I3
2830	C2
2831	C4
2832	E3
2833	B4
2834	C3
2835	B4
2836	F3
2837	H3
2838	H2
2839	G2
2840	G2
2841	B3
2842	F3
2843	G3
2844	B4
2845	F2
2846	B4
2847	G3
2849	E5
2850	D2
2851	C1
2852	A2
2853	A3
2854	B4
2856	D2
2857	C1
2858	C1
2859	D2
2860	A3
2861	A4
2862	A4
2863	A5
2864	B3
2865	C5
2866	E3
2867	G5
2869	E2
2870	I2
2871	I4
2872	G2
2873	H3
2874	I2
2875	I3
2876	H3
2877	G1
2878	G1
2879	H1
2880	C5
2881	F1
2882	H2
2884	G4
2887	C3
3700	C1
3701	B3
3702	B2
3703	B2
3704	B2
3705	A3
3706	A3
3707	A3
3708	A3
3709	D2
3710	E2
3711	A3
3712	B5
3713	F1
3714	F1
3715	F2
3716	B4
3717	B4
3720	C1
3725	B5
3726	B5
3800	E4
3801	E4
3802	E4
3803	E4
3804	E4
3805	D4
3806	D4
3807	E4
3808	E4
3809	B3
3810	F4
3811	D2
3812	F4
3813	G5
3816	G5
3817	G4
3818	F4
3819	D2
3820	G5
3821	G5
3822	G4
3823	G4
3824	G5
3825	C4
3826	D4
3827	D3
3828	C1
3830	B4
3831	C1
3832	C2
3833	C4
3834	E3
3837	B3
3838	B4
3839	B3
3840	B3
3841	G2
3842	B3
3843	F3
3844	F3
3845	B4
3846	F3
3847	F2
3848	B4
3849	G2
3850	G3
3851	H3
3852	G3
3853	G3
3854	B1
3855	B1
3856	C3
3857	E5
3858	A4
3859	A4
3860	A4
3861	A4
3862	D4
3863	B3
3864	C1
3865	B2
3866	C2
3867	C4
3869	B2
3870	C5
3871	G1
3872	D1
3873	D1
3874	D1
3875	E2
3876	E2
3877	G1
3878	F2
3879	H3
3880	H3
3881	H2
3882	I2
3883	I3
3884	H3
3885	H3
3886	H4
3887	F2
3888	H1
3889	C2
3890	D1
3891	F4
3893	G4
3894	D3
3895	D3
3896	G2
3897	F4
3898	D5
3899	D5
5801	B5
5802	C5
6871	F1
6872	F1
6873	F1
6874	F2
6875	F1
7800	C2
7801	G4
7806	G3
7807	H3
7808	E2
7812	F2
7851	B2
7871	I3
7873	G1
7874	E1
7875	C5
9800	C4
9802	D2
9803	C5
9804	B2
9805	A4
9806	B2
9808	A4
9809	A4
9810	A4
9811	A4
9812	A2
9821	H3
9822	H2
9823	C3
9825	E3
9826	G1
9829	B4
9831	F1
9832	F2
9833	F3
9834	F3
9835	G4
9837	E2
9839	B4
9840	D1
9841	B2
9842	B2
9843	B2
9844	B1
9845	B1
9846	C1
9847	D1
9848	D1
9849	B3
9850	F3
9852	A2
9853	E1
9854	D1
9855	B3
9856	D4
9857	B4
9858	F4
9859	B4
9860	D4
9861	B3
9862	B5
9863	D5
9864	G2
9865	A1
9866	D5
9867	H1
9868	A5
9869	E5
9870	B5
9871	B5
9874	B4
9875	B4
9876	B5
9881	E1
9882	C4
9883	E1
9884	E1
9887	D1
9888	E5
9889	G4
9890	D5



Component side view

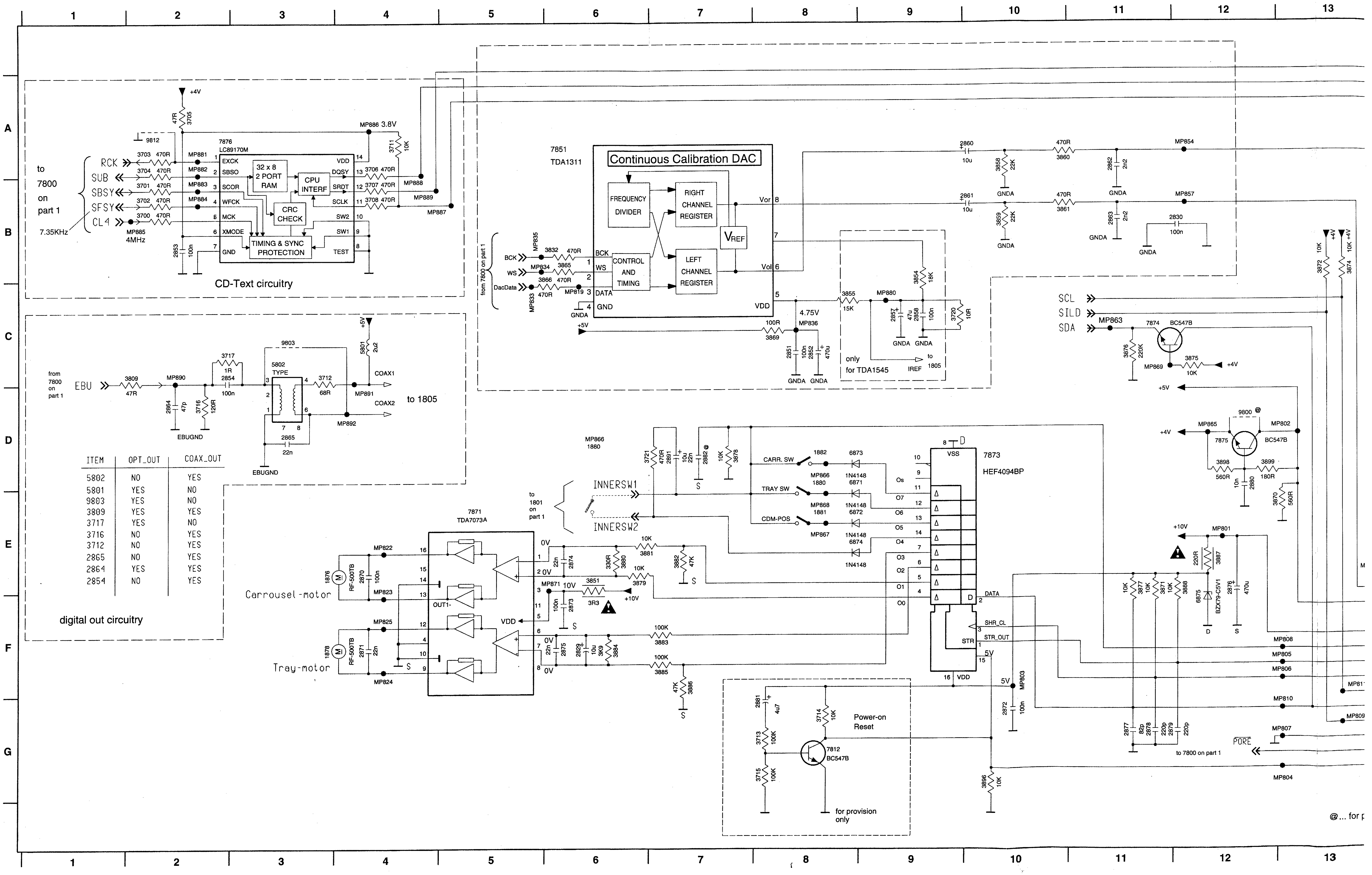
CS 53 021

1800	E3	2869	E2	3841	G2	7874	E1
1801	H2	2870	I2	3842	B3	7875	C5
1805	B5	2871	I4	3843	F3	9800	C4
1810	C3	2872	G2	3844	F3	9802	D2
1876	I1	2873	H3	3845	B4	9803	C5
1878	I4	2874	I2	3846	F3	9804	B2
1880	B2	2875	I3	3847	F2	9805	A4
1881	C4	2876	H3	3848	B4	9806	B2
1882	B1	2877	G1	3849	G2	9808	A4
2800	D4	2878	G1	3850	G3	9809	A4
2801	D3	2879	H1	3851	H3	9810	A4
2802	E4	2880	C5	3852	G3	9811	A4
2803	D3	2881	F1	3853	G3	9812	A2
2804	D4	2882	H2	3854	B1	9821	H3
2805	D3	2884	G4	3855	B1	9822	H2
2806	D3	2887	C3	3856	C3	9823	C3
2807	E4	3700	C1	3857	E5	9825	E3
2808	D3	3701	B3	3858	A4	9826	G1
2809	G3	3702	B2	3859	A4	9829	B4
2810	E4	3703	B2	3860	A4	9831	F1
2811	D3	3704	B2	3861	A4	9832	F2
2812	F4	3705	A3	3862	D4	9833	F3
2813	F4	3706	A3	3863	B3	9834	F3
2814	F4	3707	A3	3864	C1	9835	G4
2815	F4	3708	A3	3865	B2	9837	E2
2817	F4	3709	D2	3866	C2	9839	B4
2819	F4	3710	E2	3867	C4	9840	D1
2820	F5	3711	A3	3869	B2	9841	B2
2821	G5	3712	B5	3870	C5	9842	B2
2822	D5	3713	F1	3871	G1	9843	B2
2823	C3	3714	F1	3872	D1	9844	B1
2824	C4	3715	F2	3873	D1	9845	B1
2825	D4	3716	B4	3874	D1	9846	C1
2826	D2	3717	B4	3875	E2	9847	D1
2827	C2	3720	C1	3876	E2	9848	D1
2828	B3	3725	B5	3877	G1	9849	B3
2829	I3	3726	B5	3878	F2	9850	F3
2830	C2	3800	E4	3879	H3	9852	A2
2831	C4	3801	E4	3880	H3	9853	E1
2832	E3	3802	E4	3881	H2	9854	D1
2833	B4	3803	E4	3882	I2	9855	B3
2834	C3	3804	E4	3883	I3	9856	D4
2835	B4	3805	D4	3884	H3	9857	B4
2836	F3	3806	D4	3885	H3	9858	F4
2837	H3	3807	E4	3886	H4	9859	B4
2838	H2	3808	E4	3887	F2	9860	D4
2839	G2	3809	B3	3888	H1	9861	B3
2840	G2	3810	F4	3889	C2	9862	B5
2841	B3	3811	D2	3890	D1	9863	D5
2842	F3	3812	F4	3891	F4	9864	G2
2843	G3	3813	G5	3893	G4	9865	A1
2844	B4	3816	G5	3894	D3	9866	D5
2845	F2	3817	G4	3895	D3	9867	H1
2846	B4	3818	F4	3896	G2	9868	A5
2847	G3	3819	D2	3897	F4	9869	E5
2849	E5	3820	G5	3898	D5	9870	B5
2850	D2	3821	G5	3899	D5	9871	B5
2851	C1	3822	G4	5801	B5	9874	B4
2852	A2	3823	G4	5802	C5	9875	B4
2853	A3	3824	G5	6871	F1	9876	B5
2854	B4	3825	C4	6872	F1	9881	E1
2856	D2	3826	D4	6873	F1	9882	C4
2857	C1	3827	D3	6874	F2	9883	E1
2858	C1	3828	C1	6875	F1	9884	E1
2859	D2	3830	B4	7800	C2	9887	D1
2860	A3	3831	C1	7801	G4	9888	E5
2861	A4	3832	C2	7806	G3	9889	G4
2862	A4	3833	C4	7807	H3	9890	D5
2863	A5	3834	E3	7808	E2		
2864	B3	3837	B3	7812	F2		
2865	C5	3838	B4	7851	B2		
2866	E3	3839	B3	7871	I3		
2867	G5	3840	B3	7873	G1		

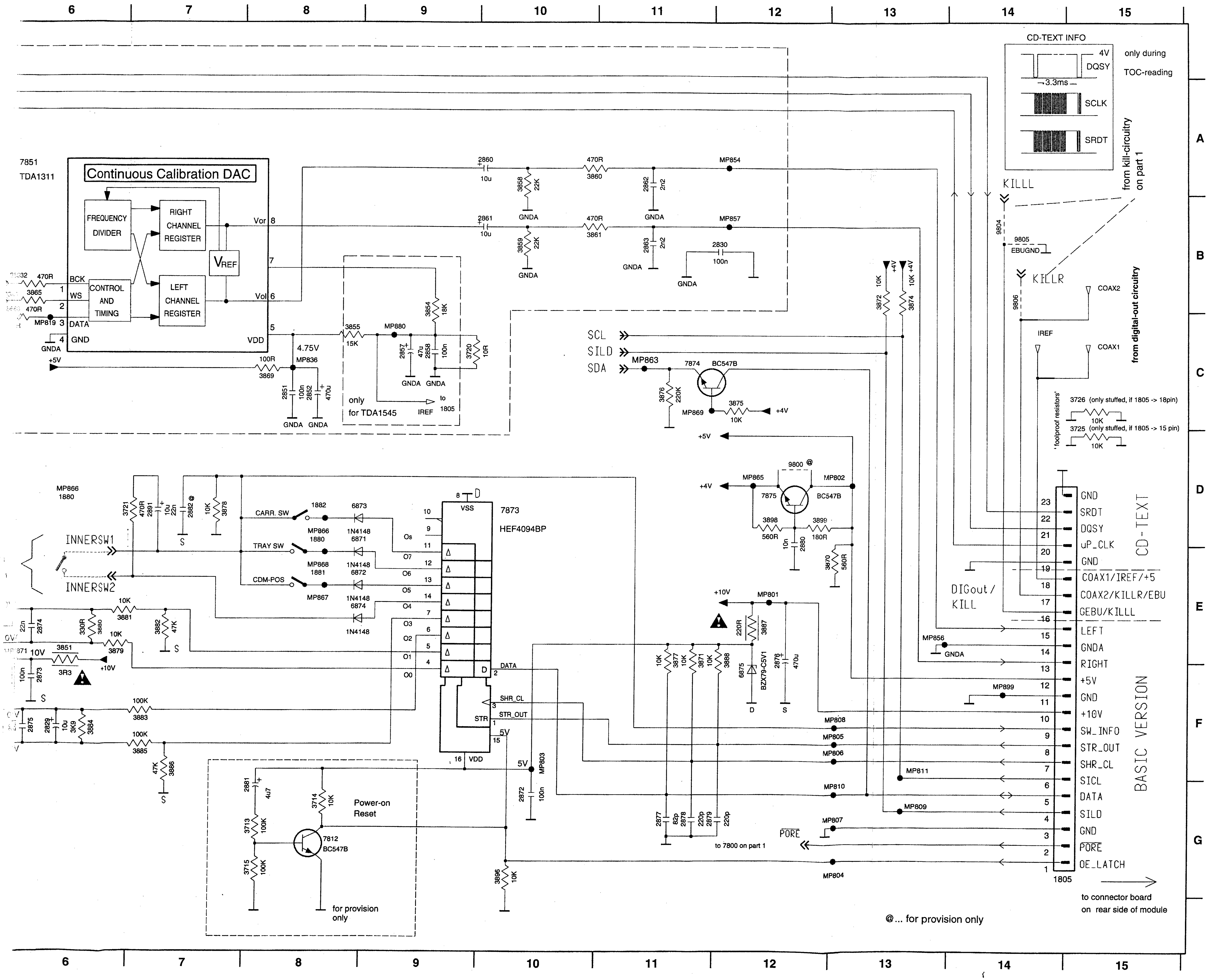

Component side view

1800	D3	2869	E3	3841	F3	9800	C1
1801	G3	2870	H4	3842	B3	9802	D4
1805	A1	2871	H2	3843	F3	9803	C1
1810	B2	2872	F4	3844	F3	9804	B4
1876	H4	2873	G2	3845	B2	9805	A2
1878	H1	2874	H3	3846	F3	9806	B4
1880	B4	2875	H2	3847	E3	9808	A2
1881	C2	2876	G3	3848	B2	9809	A2
1882	B4	2877	G4	3849	F3	9810	A2
2800	D2	2878	G4	3850	F3	9811	A2
2801	D3	2879	G4	3851	G3	9812	A3
2802	D2	2880	C1	3852	G2	9821	G3
2803	D3	2881	E4	3853	F2	9822	G3
2804	D2	2882	G4	3854	B4	9823	C3
2805	D2	2884	F2	3855	B4	9825	E3
2806	D2	2887	C2	3856	B3	9826	G4
2807	E2	3700	C4	3857	E1	9829	B2
2808	D2	3701	B3	3858	A2	9831	F4
2809	F3	3702	B3	3859	A2	9832	E4
2810	E2	3703	B3	3860	A2	9833	E2
2811	D2	3704	B3	3861	A2	9834	E2
2812	E2	3705	A3	3862	C2	9835	F2
2813	E2	3706	A3	3863	B2	9837	E4
2814	E2	3707	A3	3864	C4	9839	B2
2815	E2	3708	A3	3865	B4	9840	D4
2817	F1	3709	D4	3866	B4	9841	B4
2819	F1	3710	E4	3867	C2	9842	B4
2820	F1	3711	A3	3869	B3	9843	B4
2821	G1	3712	B1	3870	C1	9844	B4
2822	C1	3713	E4	3871	G4	9845	B4
2823	C2	3714	E4	3872	D4	9846	C4
2824	C2	3715	E4	3873	C4	9847	D4
2825	C2	3716	B2	3874	D4	9848	D4
2826	D3	3717	B2	3875	D4	9849	B3
2827	C4	3720	C4	3876	D4	9850	E2
2828	B3	3725	B1	3877	G4	9852	A4
2829	H2	3726	B1	3878	E4	9853	E4
2830	C4	3800	E2	3879	G3	9854	D4
2831	C2	3801	D2	3880	H3	9855	B3
2832	D3	3802	E2	3881	H3	9856	D2
2833	B2	3803	D2	3882	H4	9857	B2
2834	B2	3804	E2	3883	H3	9858	F2
2835	B2	3805	D2	3884	H3	9859	B1
2836	E3	3806	D2	3885	H2	9860	D2
2837	G2	3807	E2	3886	G2	9861	B3
2838	G4	3808	E1	3887	F4	9862	A1
2839	F3	3809	B3	3888	G4	9863	D1
2840	F3	3810	E2	3889	C4	9864	G4
2841	B2	3811	D3	3890	D4	9865	A4
2842	F3	3812	E2	3891	E1	9866	C1
2843	F2	3813	F1	3893	F2	9867	G4
2844	B2	3816	F1	3894	D3	9868	A1
2845	F3	3817	F2	3895	D3	9869	D1
2846	B2	3818	F1	3896	F4	9870	B1
2847	F3	3819	D4	3897	F2	9871	B1
2849	E1	3820	F1	3898	C1	9874	B2
2850	D3	3821	G1	3899	C1	9875	B1
2851	C4	3822	F2	5801	B1	9876	B1
2852	A4	3823	F2	5802	C1	9881	D4
2853	A3	3824	G1	6871	F4	9882	C2
2854	B2	3825	C2	6872	F4	9883	D4
2856	C4	3826	C2	6873	F4	9884	E4
2857	C4	3827	C2	6874	F4	9887	C4
2858	C4	3828	C4	6875	F4	9888	D1
2859	C3	3830	B2	7806	F3	9889	F2
2860	A2	3831	C4	7807	G3	9890	D1
2861	A2	3832	C4	7808	E3		
2862	A1	3833	C2	7812	E4		
2863	A1	3834	E3	7851	B4		
2864	B3	3837	B2	7871	H3		
2865	C1	3838	B2	7873	F4		
2866	E3	3839	B3	7874	D4		
2867	F1	3840	B3	7875	C1		

Circuit Diagram Main Board part2

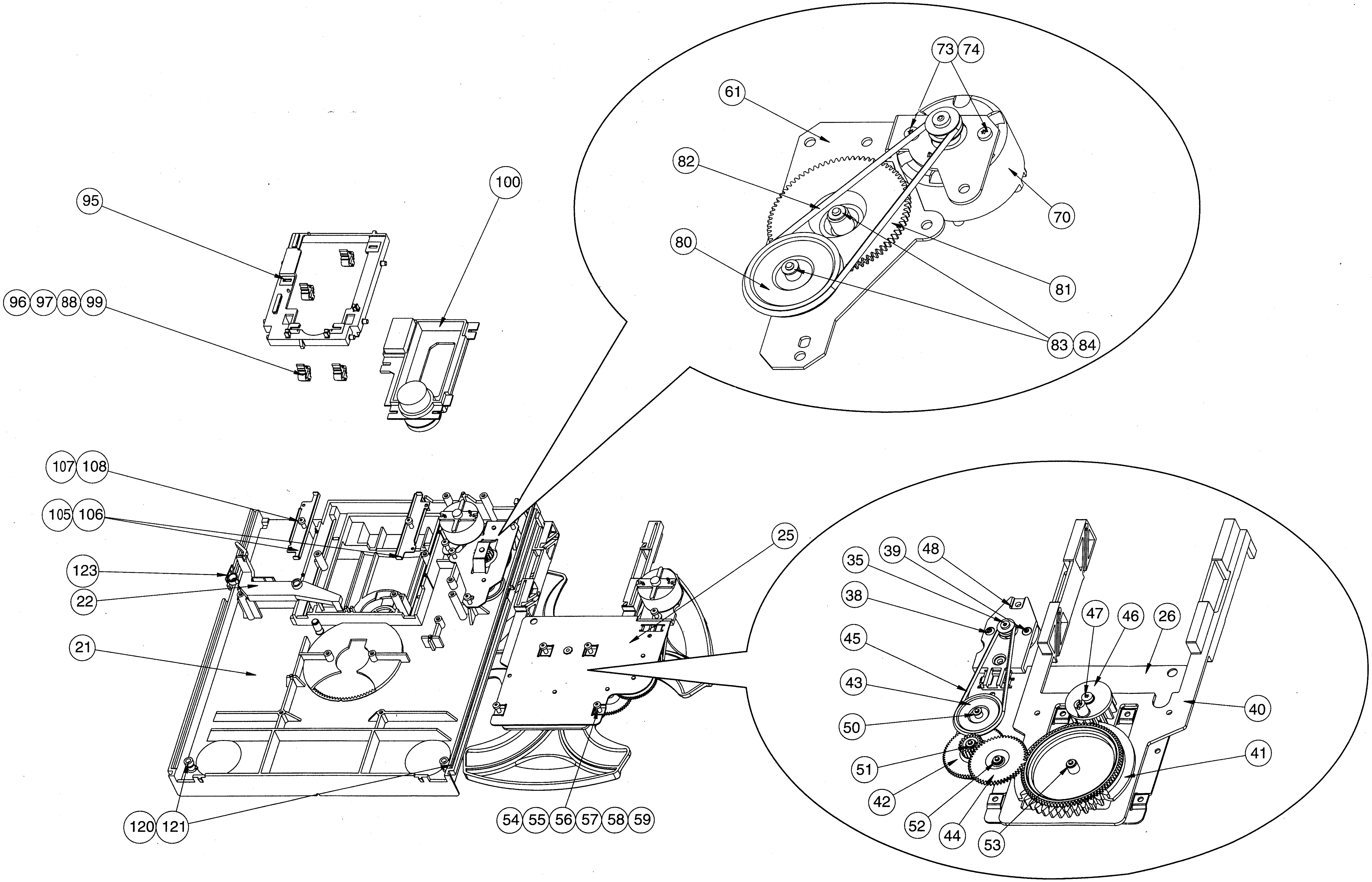

CD-Text circuitry
7876
LC89170M
EXCK
SBSO
SCOR
WFCK
MCK
XMODE
GND
VDD
DQSY
SRDT
SCLK
SW2
SW1
TEST
32 x 8
2 PORT
RAM
CPU
INTERF
CRC
CHECK
TIMING & SYNC
PROTECTION
RCK
SUB
SBSY
SFSY
CL4
to
7800
on
part 1
7.35KHz
MP885
4MHz
MP886 3.8V
+4V
9812
7851
TDA1311
Continuous Calibration DAC
FREQUENCY
DIVIDER
RIGHT
CHANNEL
REGISTER
LEFT
CHANNEL
REGISTER
CONTROL
AND
TIMING
VREF
BCK
WS
DATA
GND
VDD
Vor
Vol
DacData
from 7800 on part 1
4.75V
only
for TDA1545
IREF
to
1805
GNDA
SCL
SILD
SDA
MP863
7874
BC547B
MP869
+5V
+4V
digital out circuitry
from
7800
on
part 1
EBU
MP890
5802
TYPE
9803
COAX1
COAX2
to 1805
MP891
MP892
EBUGND
7871
TDA7073A
Carrousel-motor
Tray-motor
RF-500TB
OUT1-
VDD
0V
10V
+10V
to
1801
on
part 1
INNERSW1
INNERSW2
CARR. SW
TRAY SW
CDM-POS
7873
HEF4094BP
VSS
DATA
SHR_CL
STR_OUT
STR
16 VDD
5V
Power-on
Reset
7812
BC547B
for provision
only
9800 @
7875
BC547B
MP865
MP802
MP801
BZX79-C5V1
MP808
MP805
MP806
MP810
MP807
MP804
PORE
to 7800 on part 1
@... for p

ITEM	OPT_OUT	COAX_OUT
5802	NO	YES
5801	YES	NO
9803	YES	NO
3809	YES	YES
3717	YES	NO
3716	NO	YES
3712	NO	YES
2865	NO	YES
2864	YES	YES
2854	NO	YES


6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
CD-TEXT INFO
4V
DQSY
→3.3ms←
SCLK
SRDT
only during
TOC-reading
from kill-circuitry on part 1
from digital-out circuitry
KILLL
KILLR
9804
9805
EBUGND
9806
COAX2
COAX1
IREF
7851
TDA1311
Continuous Calibration DAC
FREQUENCY DIVIDER
RIGHT CHANNEL REGISTER
LEFT CHANNEL REGISTER
CONTROL AND TIMING
VREF
BCK
WS
DATA
GND
Vor 8
Vol 6
VDD
470R
3865
MP819
GNDA
+5V
100R
3869
4.75V
MP836
2851 100n
2852 470u
2860 10u
2861 10u
3858 22K
3859 22K
470R 3860
470R 3861
2862 2n2
2863 2n2
MP854
MP857
2830 100n
GNDA
3855 15K
MP880
3854 18K
2857 47u
2858 100n
3720 10R
only for TDA1545
IREF
to 1805
SCL
SILD
SDA
MP863
7874 BC547B
3876 220K
3875 10K
MP869
+4V
+5V
9800 @
MP865
MP802
7875 BC547B
3898 560R
3899 180R
2880 10n
3870 560R
3872 10K
3874 10K
MP866
1880
3721 470R
2891 10u
2882 @ 22n
3878 10K
CARR. SW
TRAY SW
CDM-POS
1882
1880
1881
MP866
MP868
MP867
6873
6871
6872
6874
1N4148
INNERSW1
INNERSW2
7873
HEF4094BP
VSS
VDD
Os
O7
O6
O5
O4
O3
O2
O1
O0
D
STR
DATA
SHR_CL
STR_OUT
5V
MP803
2872 100n
10K 3881
330R 3880
22n 2874
10K 3879
3882 47K
3851 3R3
10V
+10V
100n 2873
100K 3883
100K 3885
2875
2829 10u
3K9 3884
47K 3886
2881 4u7
3714 10K
3713 100K
3715 100K
7812 BC547B
Power-on Reset
for provision only
3896 10K
+10V
MP801
220R 3887
3888
3877 10K
3871 10K
6875 BZX79-C5V1
2876 470u
2877 82p
2878 220p
2879 220p
220p
to 7800 on part 1
PORE
MP856
GNDA
MP899
MP808
MP805
MP806
MP811
MP810
MP809
MP807
MP804
DIGout / KILL
1805
GND
SRDT
DQSY
uP_CLK
COAX1/IREF/+5
COAX2/KILLR/EBU
GEBU/KILLL
LEFT
GNDA
RIGHT
+5V
+10V
SW_INFO
STR_OUT
SHR_CL
SICL
DATA
SILD
PORE
OE_LATCH
CD-TEXT
BASIC VERSION
3726 (only stuffed, if 1805 -> 18pin)
3725 (only stuffed, if 1805 -> 15 pin)
10K
'foolproof resistors'
to connector board on rear side of module
@... for provision only

1805	G14
1876	E3
1878	F3
1880	D8
1881	E8
1882	D8
2829	F6
2830	B12
2851	C8
2852	C8
2853	B2
2854	C2
2857	C9
2858	C9
2860	A10
2861	B10
2862	A11
2863	B11
2864	D2
2865	D3
2870	E4
2871	F4
2872	G10
2873	F6
2874	E6
2875	F6
2876	E12
2877	G11
2878	G11
2879	G11
2880	D12
2881	G8
2882	D7
3700	B2
3701	B2
3702	B2
3703	A2
3704	A2
3705	A2
3706	A4
3707	B4
3708	B4
3711	A4
3712	C3
3713	G8
3714	G8
3715	G8
3716	D2
3717	C2
3720	C9
3725	D15
3726	C15
3809	C2
3832	B6
3851	E6
3854	B9
3855	C8
3858	A10
3859	B10
3860	A10
3861	B10
3865	B6
3866	C6
3869	C8
3870	E12
3871	E11
3872	B13
3874	B13
3875	C12
3876	C11
3877	E11
3878	D7
3879	E6
3880	E6
3881	E6
3882	E7
3883	F7
3884	F6
3885	F7
3886	F7
3887	E12
3888	E12
3896	G10
3898	D12
3899	D12
5801	C4
5802	C3
6871	D8
6872	E8
6873	D8
6874	E8
6875	F12
7812	G8
7851	A6
7871	E5
7873	D10
7874	C11
7875	D12
7876	A2
9800	D12
9803	C3
9804	B14
9805	B14
9806	B14
9808	A10
9809	A10
9810	B10
9811	B10
9812	A2
MP801	E12
MP802	D13
MP803	F10
MP804	G13
MP805	F13
MP806	F13
MP807	G13
MP808	F13
MP809	G13
MP810	G13
MP811	F13
MP819	C6
MP822	E4
MP823	E4
MP824	F4
MP825	F4
MP833	C5
MP834	B5
MP835	B5
MP836	C8
MP854	A12
MP856	E13
MP857	B12
MP863	C11
MP865	D12
MP866	D8
MP867	E8
MP868	E8
MP869	C11
MP871	E6
MP880	C9
MP881	A2
MP882	A2
MP883	B2
MP884	B2
MP885	B2
MP886	A4
MP887	B4
MP888	B4
MP889	B4
MP890	C2
MP891	D4
MP892	D4
MP899	F14

EXPLODED VIEW (3CDC MODULE)


73
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100
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123
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120
121
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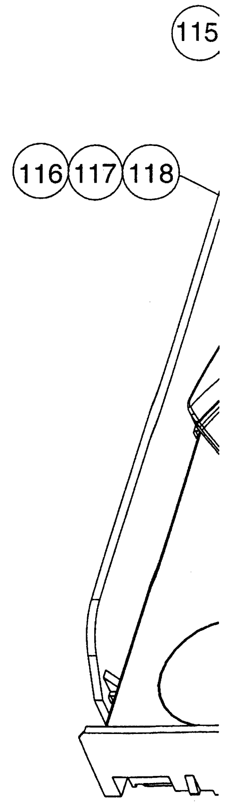
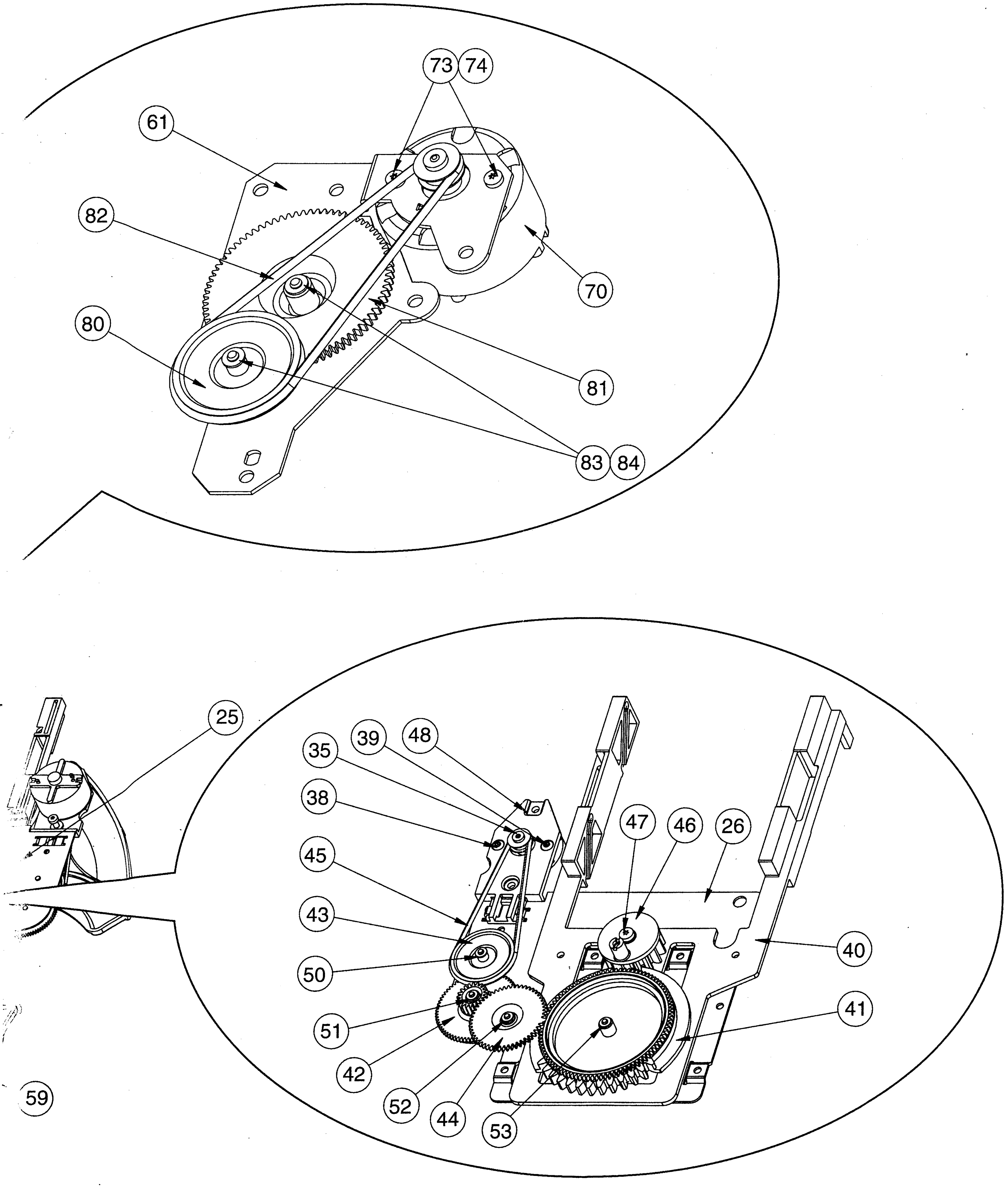

115
116
117
118

MECHANICAL PART

	4822 390 101
3	4822 463 110
4	4822 463 110
21	4822 441 116
22	4822 402 100
38	4822 502 125
39	4822 502 125
40	4822 463 110
41	4822 522 105
42	4822 522 104


73
74
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82
70
80
81
83
84
25
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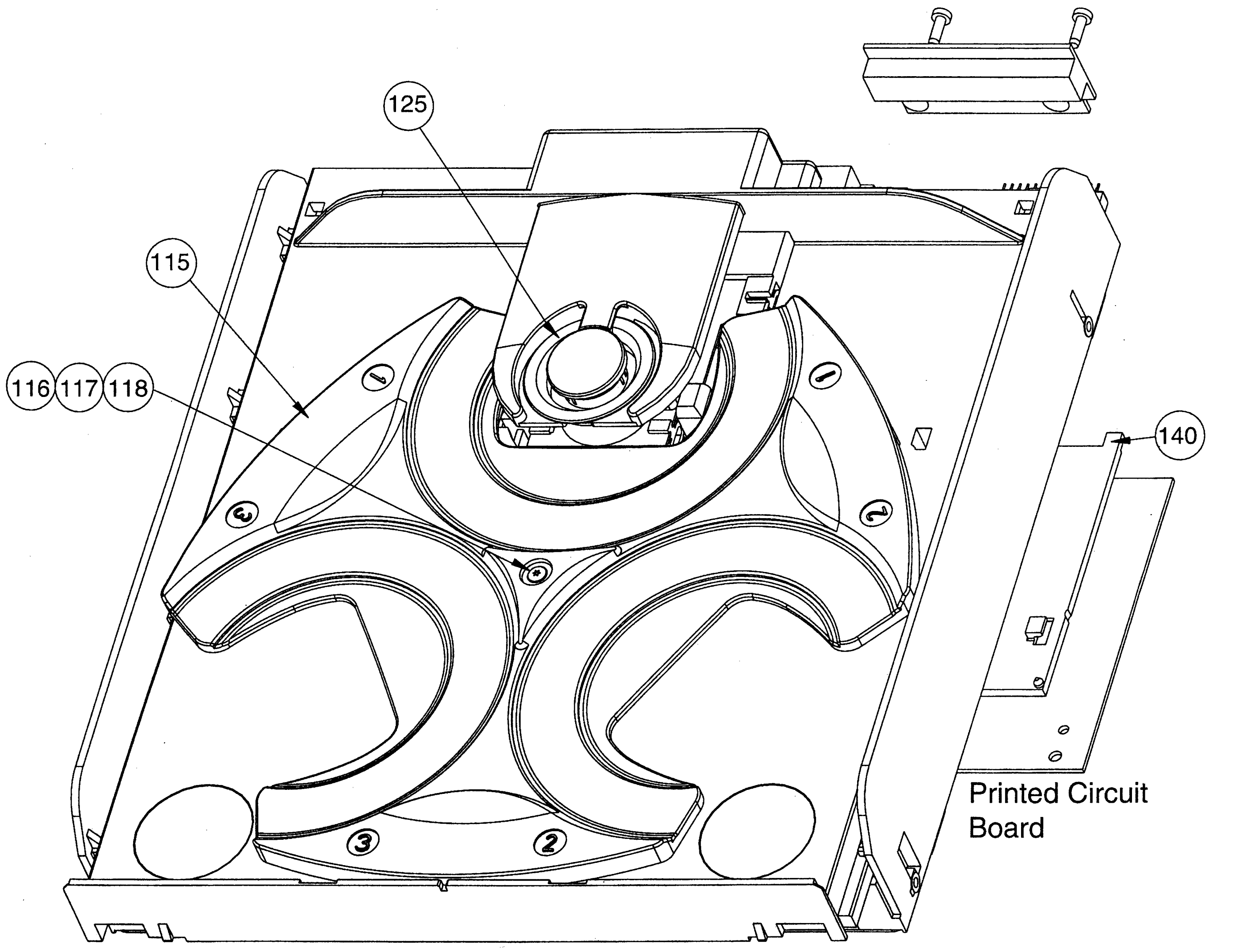
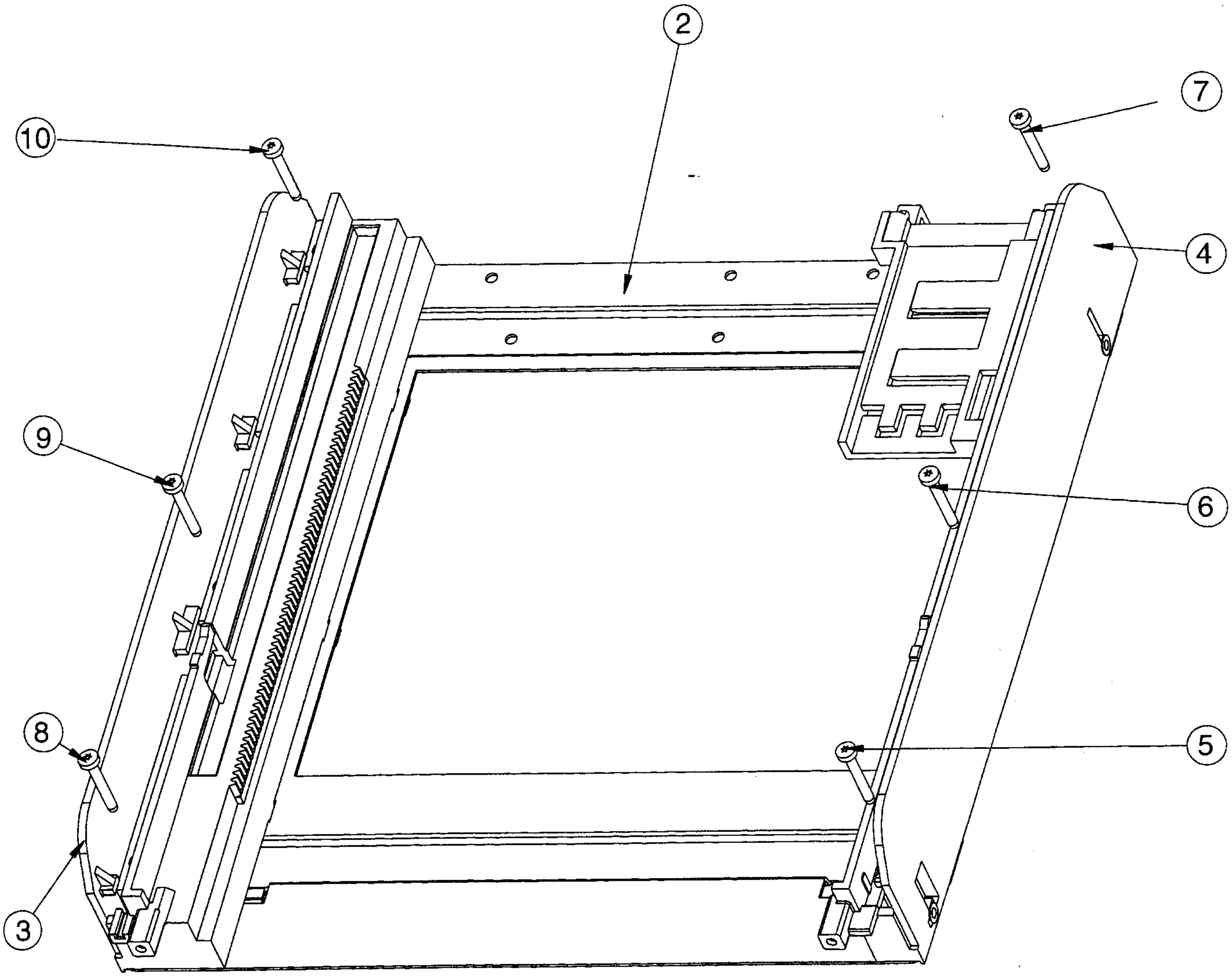

125
115
116
117
118
140
Printed Circuit Board

MECHANICAL PARTSLIST 3CDC MODULE

	4822 390 10136	POLYLUB GLY801 (GREASE)	43	4822 528 10937	PULLEY
3	4822 463 11008	GUIDE LEFT	44	4822 522 10493	IDLER WHEEL
4	4822 463 11009	GUIDE RIGHT	45	4822 358 10115	BELT
21	4822 441 11615	DRAWER	46	4822 466 10735	ECCENTRIC GEAR WHEEL
22	4822 402 10088	BRACKET TUMBLER	50	4822 532 12364	WASHER
38	4822 502 12548	SCREW M2,6X3,5	51	4822 532 12364	WASHER
39	4822 502 12548	SCREW M2,6X3,5	52	4822 532 12364	WASHER
40	4822 463 11011	SLIDE	53	4822 532 12364	WASHER
41	4822 522 10509	CONTROL DISC	35	4822 361 10753	CARROUSEL MOTOR
42	4822 522 10492	GEAR WHEEL	70	4822 361 10753	CARROUSEL MOTOR



MECHANICAL PARTSLIST 3CDC MODULE

73	4822 502 12548	SCREW M2,6X3,5
74	4822 502 12548	SCREW M2,6X3,5
80	4822 528 10937	PULLEY
81	4822 522 10494	GEAR DRAWER
82	4822 358 10115	BELT
83	4822 532 12364	WASHER
84	4822 532 12364	WASHER
95	4822 404 10894	SUPPORT
96	4822 325 50215	SUSPENSION
97	4822 325 50215	SUSPENSION
98	4822 325 50215	SUSPENSION
99	4822 325 50215	SUSPENSION
100	4822 691 10615	CD DRIVE VAM1201
115	4822 466 10736	CARROUSEL
117	4822 532 12365	BUSH DRAWER
120	4822 532 51756	GROMMET
121	4822 532 51756	GROMMET
123	4822 402 10085	SWITCH BRACKET
125	4822 401 11708	DISC CLAMP
140	4822 466 10734	PLATE

ELECTRICAL PARTSLIST 3CDC MODULE

MISCELLANEOUS

1800	4822 267 51453	Flex Foil connector 12pin
1805	4822 265 10979	Flex Foil connector 15pin
1805	4822 265 11182	Flex Foil connector 23pin
1805	4822 265 11184	Flex Foil connector 18pin
1806	4822 265 10981	Flex Foil connector 15pin
1806	4822 267 10757	Flex Foil connector 23pin top entry
1806	4822 265 11185	Flex Foil connector 18pin top entry
1860	4822 265 11183	Flex Foil connector 4pin side entry
1880	4822 276 13503	Switch
1881	4822 276 13503	Switch
1882	4822 276 13503	Switch
8002	4822 320 11974	Flex Foil 15pin length= 190mm
8002	4822 320 12229	Flex Foil 18pin length= 190mm
8002	4822 320 12231	Flex Foil 23pin length= 190mm
8002	4822 320 12232	Flex Foil 15pin length= 480mm

CAPACITORS

2800	4822 126 10053	180pF	10%	50V
2801	4822 122 10466	220pF	10%	50V
2802	4822 126 10053	180pF	10%	50V
2803	4822 122 10466	220pF	10%	50V
2804	4822 126 12787	330pF	10%	50V
2805	4822 122 10466	220pF	10%	50V
2806	4822 122 10466	220pF	10%	50V
2807	4822 126 12878	1,5nF	10%	16V
2808	4822 122 10466	220pF	10%	50V
2809	4822 126 12882	100nF	20%	50V
2810	4822 122 10459	560pF	10%	50V
2811	4822 122 10466	220pF	10%	50V
2812	4822 122 10319	82pF	5%	50V
2813	4822 122 10319	82pF	5%	50V
2814	4822 122 33849	150pF	10%	50V
2815	4822 122 33192	27pF	5%	50V
2817	4822 122 33849	150pF	10%	50V
2819	4822 122 33848	47pF	5%	50V
2820	4822 122 33848	47pF	5%	50V
2821	4822 122 10462	15pF	5%	50V
2822	4822 126 12339	2,2nF	10%	16V
2823	4822 122 33848	47pF	5%	50V
2824	4822 126 11585	22nF	20%	50V
2825	4822 126 12882	100nF	20%	50V
2826	4822 124 23624	470µF	20%	16V
2827	4822 126 12882	100nF	20%	50V
2828	4822 126 12882	100nF	20%	50V
2829	4822 124 41579	10µF	20%	50V
2830	4822 126 12882	100nF	20%	50V
2831	4822 124 12032	4,7µF	20%	50V
2832	4822 124 12032	4,7µF	20%	50V
2833	4822 122 33191	22pF	5%	50V
2834	4822 122 33191	22pF	5%	50V
2835	4822 126 12882	100nF	20%	50V
2837	4822 126 12882	100nF	20%	50V
2838	4822 126 12882	100nF	20%	50V
2839	4822 126 12882	100nF	20%	50V
2840	4822 126 12882	100nF	20%	50V
2841	4822 122 10574	1,2nF	10%	16V
2842	4822 121 51387	10nF	20%	16V
2843	4822 126 12882	100nF	20%	50V
2844	4822 122 10574	1,2nF	10%	16V
2845	4822 121 51387	10nF	20%	16V
2846	4822 126 11585	22nF	20%	50V
2847	4822 126 12882	100nF	20%	50V

CAPACITORS

2849	4822 126 11585	22nF	20%	50V
2850	4822 122 33197	1nF	10%	50V
2851	4822 126 12882	100nF	20%	50V
2852	4822 124 80857	470µF	20%	16V
2853	4822 126 12882	100nF	20%	50V
2856	4822 122 33848	47pF	5%	50V
2859	4822 126 12882	100nF	20%	50V
2860	4822 124 41579	10µF	20%	50V
2861	4822 124 41579	10µF	20%	50V
2862	4822 126 12339	2,2nF	10%	16V
2863	4822 126 12339	2,2nF	10%	16V
2864	4822 122 33848	47pF	5%	50V
2866	4822 126 12882	100nF	20%	50V
2867	4822 122 33848	47pF	5%	50V
2868	4822 126 12882	100nF	20%	50V
2869	4822 126 12882	100nF	20%	50V
2870	4822 126 12882	100nF	20%	50V
2871	4822 126 11585	22nF	20%	50V
2872	4822 126 12882	100nF	20%	50V
2873	4822 126 12882	100nF	20%	50V
2874	4822 126 11585	22nF	20%	50V
2875	4822 126 11585	22nF	20%	50V
2876	4822 124 80857	470µF	20%	16V
2877	4822 122 10319	82pF	5%	50V
2878	4822 122 10466	220pF	10%	50V
2879	4822 122 10466	220pF	10%	50V
2880	4822 121 51387	10nF	20%	16V
2884	4822 126 12882	100nF	20%	50V
2887	4822 126 12882	100nF	20%	50V
2890	4822 124 23624	470µF	20%	16V
2891	4822 124 12125	10µF	20%	16V

RESISTORS

3700	4822 116 83883	470Ω	5%	0,16W
3701	4822 116 83883	470Ω	5%	0,16W
3702	4822 116 83883	470Ω	5%	0,16W
3703	4822 116 83883	470Ω	5%	0,16W
3704	4822 116 83883	470Ω	5%	0,16W
3705	4822 116 52195	47Ω	5%	0,5W
3706	4822 116 83883	470Ω	5%	0,16W
3707	4822 116 83883	470Ω	5%	0,16W
3708	4822 116 83883	470Ω	5%	0,16W
3710	4822 116 83864	10kΩ	5%	0,5W
3711	4822 116 83864	10kΩ	5%	0,5W
3717	4822 116 80176	1Ω	5%	0,5W
3720	4822 116 52176	10Ω	5%	0,5W
3721	4822 116 83883	470Ω	5%	0,16W
3725	4822 116 83864	10kΩ	5%	0,5W
3726	4822 116 83864	10kΩ	5%	0,5W
3800	4822 116 52239	120kΩ	5%	0,5W
3801	4822 116 83864	10kΩ	5%	0,5W
3802	4822 116 52239	120kΩ	5%	0,5W
3803	4822 116 83864	10kΩ	5%	0,5W
3804	4822 116 52291	56kΩ	5%	0,5W
3805	4822 116 83864	10kΩ	5%	0,5W
3806	4822 116 83864	10kΩ	5%	0,5W
3807	4822 116 83864	10kΩ	5%	0,5W
3808	4822 116 83864	10kΩ	5%	0,5W
3809	4822 116 52175	100Ω	5%	0,5W
3810	4822 050 11002	1kΩ	5%	0,2W
3812	4822 116 83884	47kΩ	5%	0,16W
3813	4822 116 83864	10kΩ	5%	0,5W
3816	4822 116 52269	3,3kΩ	5%	0,5W

ELECTRICAL PARTSLIST 3CDC MODULE

RESISTORS

3817	4822 116 83961	6,8kΩ	5%	0,16W
3818	4822 116 83864	10kΩ	5%	0,5W
3819	4822 116 83883	470Ω	5%	0,16W
3820	4822 116 52269	3,3kΩ	5%	0,5W
3821	4822 116 52269	3,3kΩ	5%	0,5W
3822	4822 116 52257	22kΩ	5%	0,5W
3823	4822 116 52269	3,3kΩ	5%	0,5W
3824	4822 116 52269	3,3kΩ	5%	0,5W
3825	4822 050 11002	1kΩ	5%	0,2W
3826	4822 116 52257	22kΩ	5%	0,5W
3827	4822 116 52278	390kΩ	5%	0,5W
3828	4822 116 52257	22kΩ	5%	0,5W
3830	4822 116 52235	1MΩ	5%	0,5W
3831	4822 116 52257	22kΩ	5%	0,5W
3832	4822 116 83883	470Ω	5%	0,16W
3833	4822 116 83864	10kΩ	5%	0,5W
3834	4822 116 52283	4,7kΩ	5%	0,5W
3837	4822 050 11002	1kΩ	5%	0,2W
3838	4822 050 11002	1kΩ	5%	0,2W
3839	4822 116 52245	150kΩ	5%	0,16W
3840	4822 116 52245	150kΩ	5%	0,16W
3841	4822 116 83961	6,8kΩ	5%	0,16W
3842	4822 116 83864	10kΩ	5%	0,5W
3843	4822 116 52303	8,2kΩ	5%	0,5W
3844	4822 116 52226	560Ω	5%	0,5W
3844	4822 116 83883	470Ω	5%	0,16W
3845	4822 116 83864	10kΩ	5%	0,5W
3846	4822 116 52303	8,2kΩ	5%	0,5W
3847	4822 116 52228	680Ω	5%	0,5W
3847	4822 116 83883	470Ω	5%	0,16W
3848	4822 116 52303	8,2kΩ	5%	0,5W
3849	4822 116 52303	8,2kΩ	5%	0,5W
3850	4822 116 83883	470Ω	5%	0,16W
3851	4822 052 10338	3,3Ω		NFR25
3852	4822 052 10338	3,3Ω		NFR25
3853	4822 052 10338	3,3Ω		NFR25
3856	4822 116 52219	330Ω	5%	0,5W
3856	4822 116 80176	1Ω	5%	0,5W
3857	4822 050 11002	1kΩ	5%	0,2W
3858	4822 116 52257	22kΩ	5%	0,5W
3859	4822 116 52257	22kΩ	5%	0,5W
3860	4822 116 83883	470Ω	5%	0,16W
3861	4822 116 83883	470Ω	5%	0,16W
3862	4822 116 52175	100Ω	5%	0,5W
3863	4822 116 52175	100Ω	5%	0,5W
3864	4822 116 52175	100Ω	5%	0,5W
3865	4822 116 83883	470Ω	5%	0,16W
3866	4822 116 83883	470Ω	5%	0,16W
3867	4822 116 52234	100kΩ	5%	0,5W
3868	4822 116 52191	33Ω	5%	0,5W
3869	4822 116 52175	100Ω	5%	0,5W
3870	4822 116 52226	560Ω	5%	0,5W
3871	4822 116 83864	10kΩ	5%	0,5W
3872	4822 116 83864	10kΩ	5%	0,5W
3873	4822 116 83883	470Ω	5%	0,16W
3874	4822 116 83864	10kΩ	5%	0,5W
3875	4822 116 83864	10kΩ	5%	0,5W
3876	4822 116 83874	220kΩ	5%	0,5W
3877	4822 116 83864	10kΩ	5%	0,5W
3878	4822 116 83864	10kΩ	5%	0,5W

RESISTORS

3879	4822 116 83864	10kΩ	5%	0,5W
3880	4822 116 52219	330Ω	5%	0,5W
3881	4822 116 83864	10kΩ	5%	0,5W
3882	4822 116 83884	47kΩ	5%	0,16W
3883	4822 116 52234	100kΩ	5%	0,5W
3884	4822 116 52276	3,9kΩ	5%	0,5W
3885	4822 116 52234	100kΩ	5%	0,5W
3886	4822 116 83884	47kΩ	5%	0,16W
3887	4822 052 10221	220Ω	5%	
3888	4822 116 83864	10kΩ	5%	0,5W
3889	4822 116 83883	470Ω	5%	0,16W
3890	4822 116 83883	470Ω	5%	0,16W
3891	4822 116 52272	330kΩ	5%	0,5W
3893	4822 116 52257	22kΩ	5%	0,5W
3894	4822 116 52191	33Ω	5%	0,5W
3895	4822 116 52176	10Ω	5%	0,5W
3896	4822 116 83864	10kΩ	5%	0,5W
3897	4822 116 52226	560Ω	5%	0,5W
3898	4822 116 52226	560Ω	5%	0,5W
3899	4822 116 52213	180Ω	5%	0,5W

COILS

1810	4822 242 10849	CRYSTAL 8MHz
1810	4822 242 73557	CERAMIC RES. 8,46MHz
5801	4822 157 11477	2,2µH

DIODES

6871	4822 130 30621	1N4148
6872	4822 130 30621	1N4148
6873	4822 130 30621	1N4148
6874	4822 130 30621	1N4148
6875	4822 130 34233	BZX79-B5V1

TRANSISTORS

7808	4822 130 41344	BC337-40
7874	4822 130 40959	BC547B
7875	4822 130 40959	BC547B

INTEGRATED CIRCUITS

7800 ©	4822 209 12752	SAA7378GP (Signal Processor CD7)
7801 ©	5322 209 11517	PC74HCU04T (HF Amplifier)
7806	4822 209 32852	TDA7073A/N2 (Servo Driver)
7807	4822 209 32852	TDA7073A/N2 (Motor Driver)
7810	4822 130 10845	OPTICAL OUT UNIT
7851	4822 209 32421	TDA1311A/N2(DAC)
7871	4822 209 32852	TDA7073A/N2 (Motor Driver)
7873	5322 209 10421	HEF4094BP (Shift Register)
7876	4822 209 16143	LC89170M (CD Text)

POWER 5 MODULE

(including MAINS BOARD)

(2-Channel version)

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Ground plan 11-1
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Block and Wiring diagram 11-3
Mains and PS & L/R Amplifier board layout 11-4
Mains & Power Supply circuit................................. 11-5
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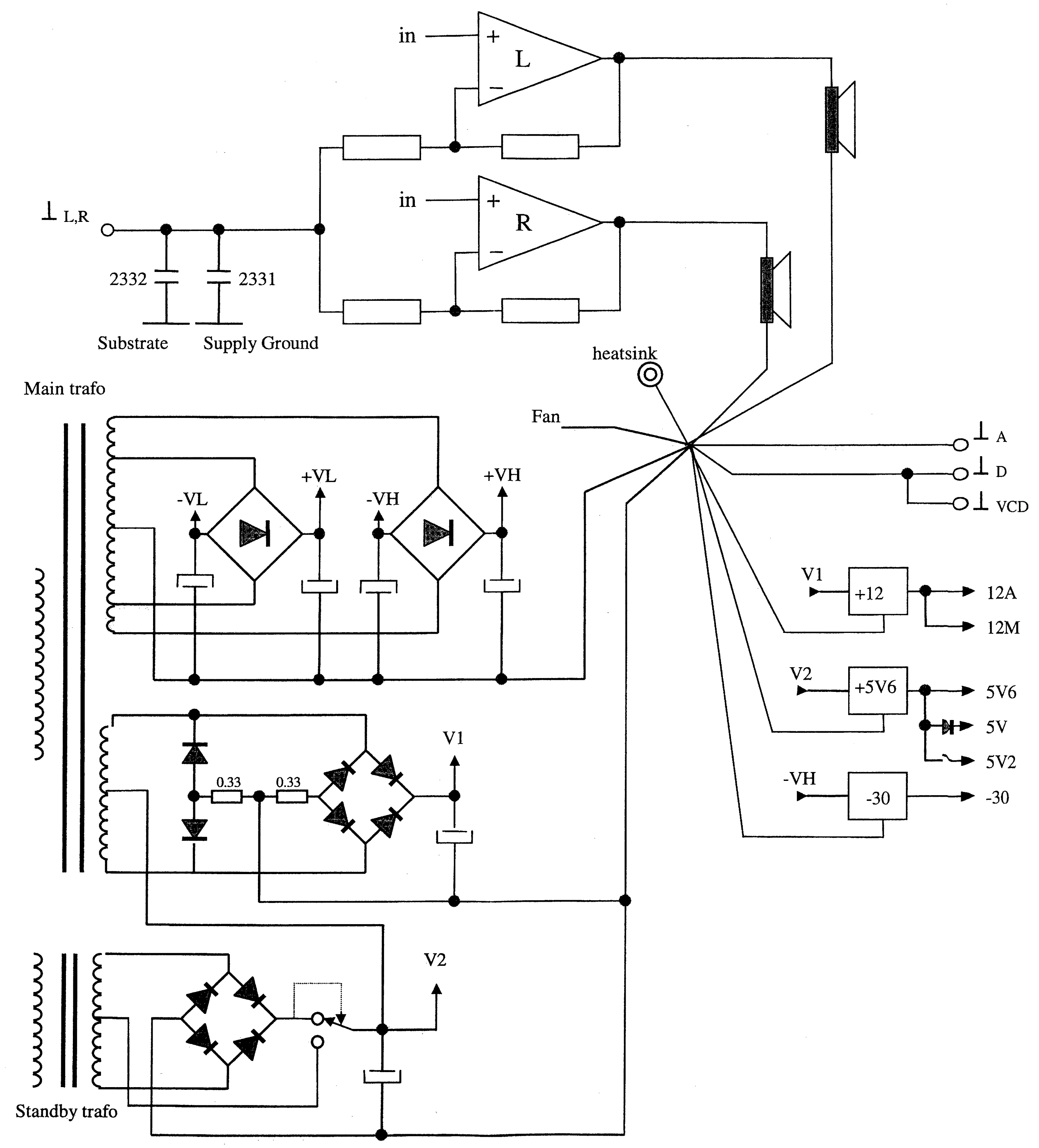
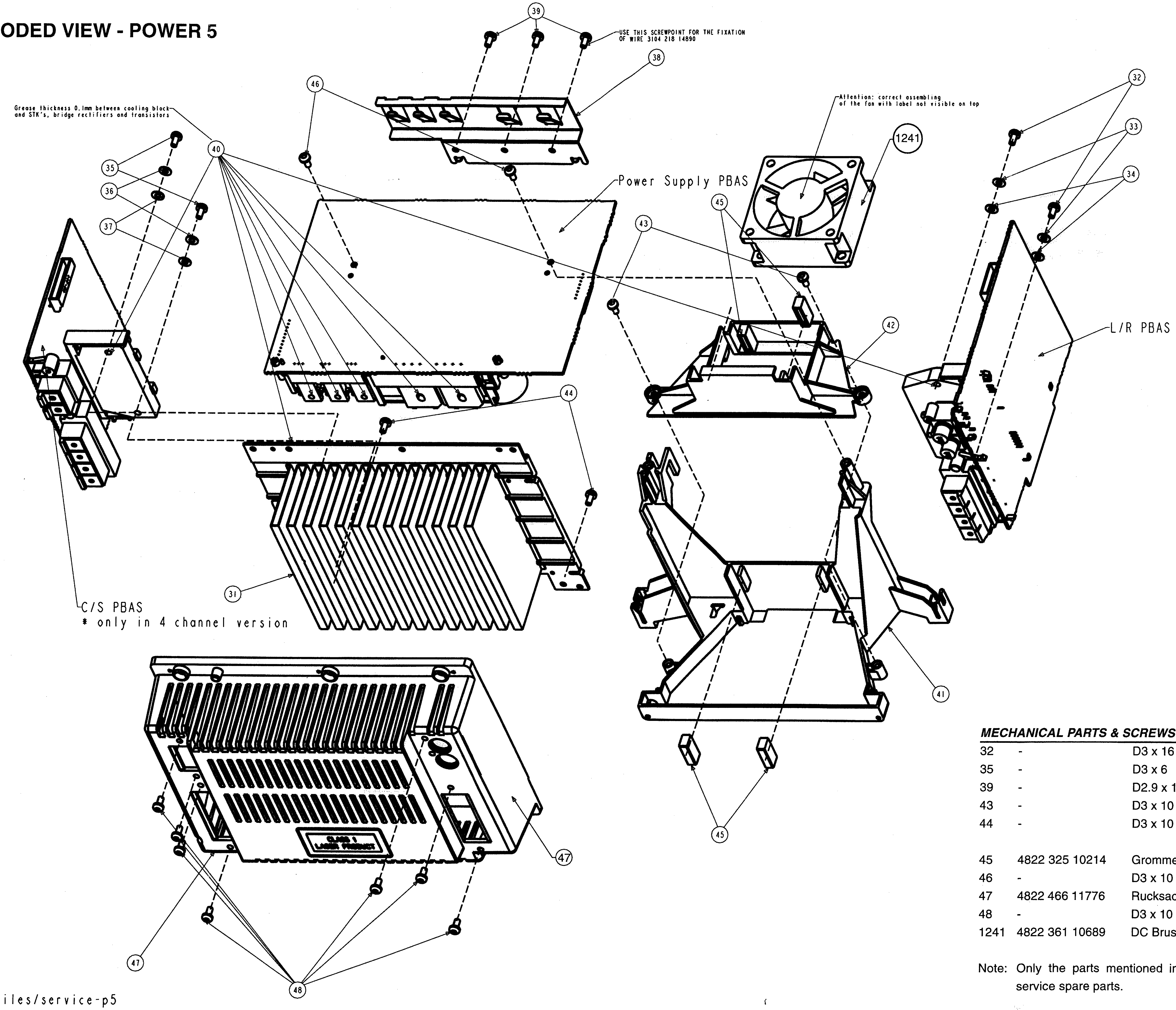
Electrical parts list.. 11-7

GROUND PLAN MASSA


in
+
−
L
in
+
−
R
⊥ L,R
2332
2331
Substrate
Supply Ground
heatsink
Main trafo
Fan
⊥ A
⊥ D
⊥ VCD
-VL
+VL
-VH
+VH
V1
+12
12A
12M
V2
+5V6
5V6
5V
5V2
-VH
-30
-30
V1
0.33
0.33
V2
Standby trafo

EXPLODED VIEW - POWER 5

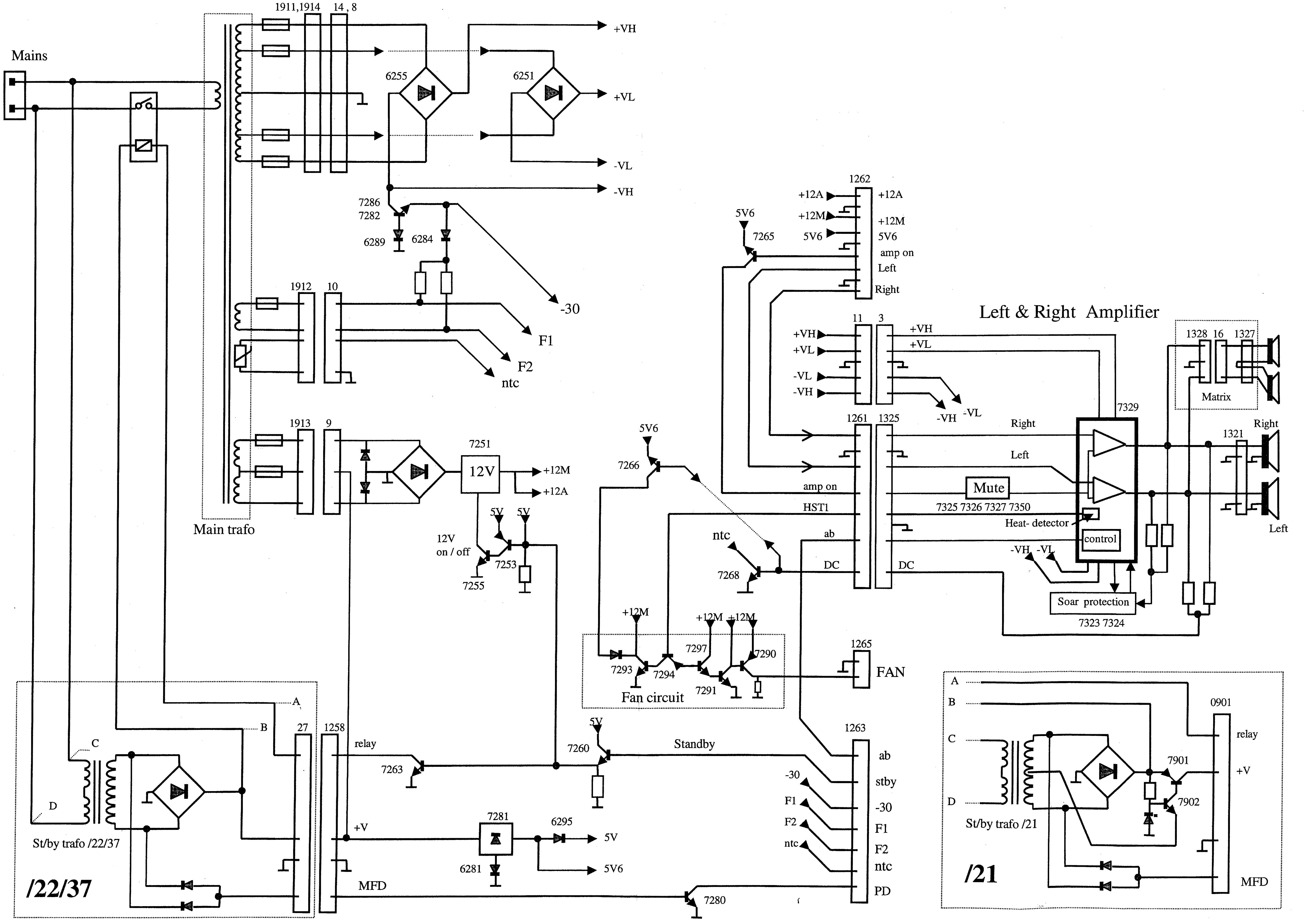

39
USE THIS SCREWPOINT FOR THE FIXATION OF WIRE 3104 218 14890
38
46
Grease thickness 0.1mm between cooling block and STK's, bridge rectifiers and transistors
40
35
36
37
Power Supply PBAS
Attention: correct assembling of the fan with label not visible on top
1241
32
33
34
45
43
42
L/R PBAS
44
31
C/S PBAS
* only in 4 channel version
41
CLASS 1 LASER PRODUCT
47
45
47
48

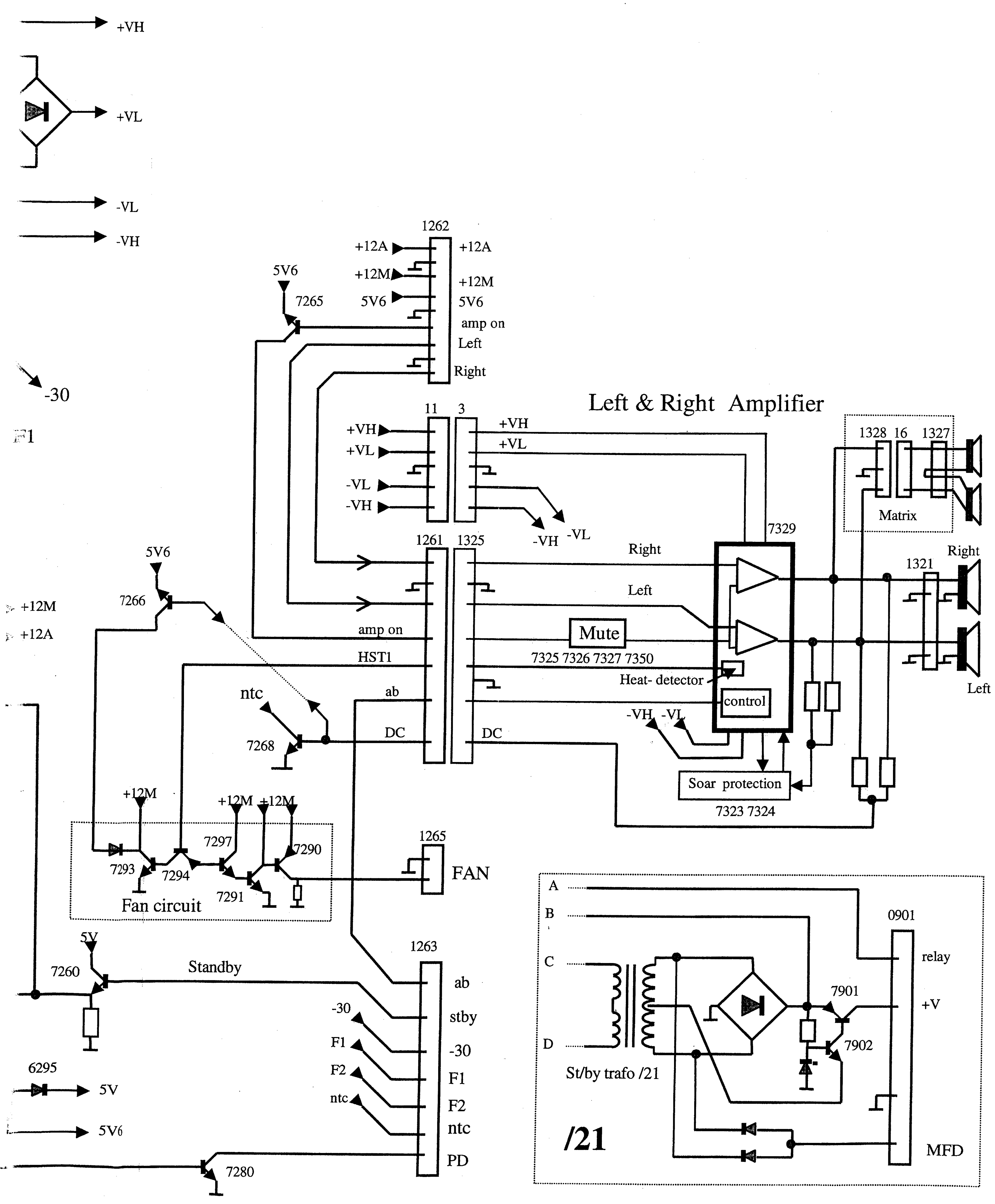
MECHANICAL PARTS & SCREWS LIST

32	-	D3 x 16
35	-	D3 x 6
39	-	D2.9 x 13
43	-	D3 x 10
44	-	D3 x 10
45	4822 325 10214	Grommet
46	-	D3 x 10
47	4822 466 11776	Rucksack P5
48	-	D3 x 10
1241	4822 361 10689	DC Brushless Fan

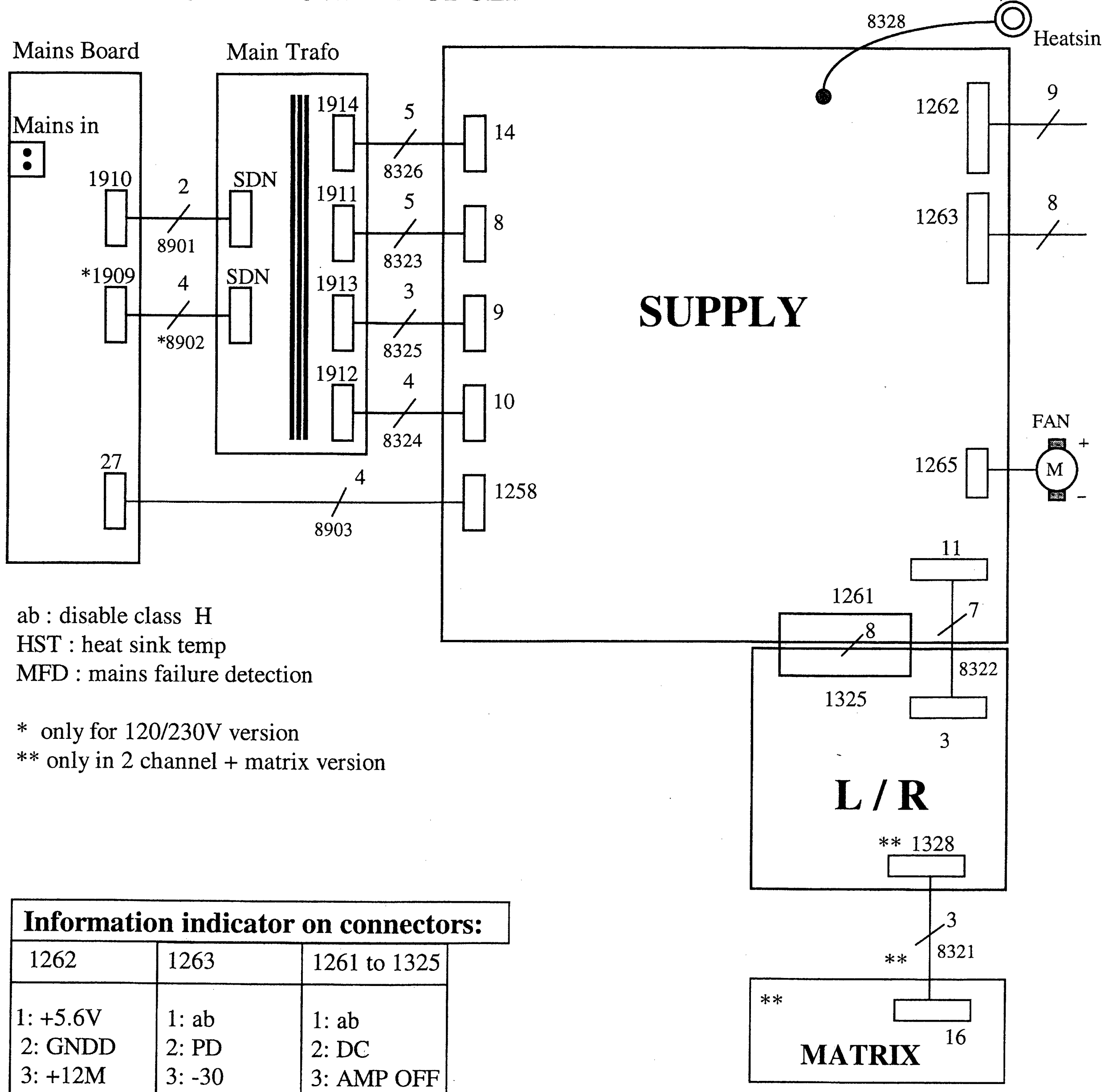
Note: Only the parts mentioned in this list are normal service spare parts.

Blockdiagram powermodule 2 channel + matrix


Mains
1911,1914
14 , 8
+VH
6255
6251
+VL
-VL
-VH
7286
7282
6289
6284
-30
1912
10
F1
F2
ntc
1913
9
7251
12V
+12M
+12A
5V
5V
12V
on / off
7253
7255
Main trafo
A
B
C
D
27
1258
relay
7263
7260
5V
Standby
+V
7281
6295
5V
5V6
6281
MFD
7280
St/by trafo /22/37
/22/37
1262
+12A
+12A
+12M
+12M
5V6
5V6
amp on
Left
Right
5V6
7265
11
3
+VH
+VH
+VL
+VL
-VL
-VH
-VH
-VL
Left & Right Amplifier
1328
16
1327
Matrix
7329
1261
1325
Right
Left
Right
1321
Left
5V6
7266
amp on
HST1
Mute
7325 7326 7327 7350
Heat- detector
control
ntc
ab
7268
DC
DC
-VH
-VL
Soar protection
7323 7324
+12M
+12M
+12M
7297
7290
7293
7294
7291
Fan circuit
1265
FAN
1263
ab
stby
-30
-30
F1
F1
F2
F2
ntc
ntc
PD
A
B
C
D
0901
relay
+V
7901
7902
St/by trafo /21
/21
MFD


+VH
+VL
-VL
-VH
-30
F1
5V6
7265
1262
+12A
+12M
5V6
+12A
+12M
5V6
amp on
Left
Right
Left & Right Amplifier
11
3
+VH
+VL
-VL
-VH
+VH
+VL
-VL
-VH
1261
1325
7329
Right
Left
amp on
HST1
Mute
7325 7326 7327 7350
Heat- detector
control
ab
DC
DC
-VH -VL
Soar protection
7323 7324
1328 16 1327
Matrix
1321
Right
Left
5V6
7266
+12M
+12A
ntc
7268
+12M
+12M +12M
7297
7290
7293
7294
7291
Fan circuit
1265
FAN
5V
7260
Standby
1263
ab
stby
-30
F1
F2
ntc
PD
-30
F1
F2
ntc
6295
5V
5V6
7280
A
B
C
D
0901
relay
+V
7901
7902
MFD
St/by trafo /21
/21

WIRING DIAGRAM POWER MODULE


8328
Heatsin
Mains Board
Main Trafo
Mains in
1910
2
8901
SDN
*1909
4
*8902
SDN
1914
1911
1913
1912
5
8326
5
8323
3
8325
4
8324
14
8
9
10
1258
27
4
8903
SUPPLY
1262
9
1263
8
FAN
1265
M
+
-
11
1261
7
8
8322
1325
3
L / R
** 1328
3
8321
**
**
16
MATRIX

ab : disable class H
HST : heat sink temp
MFD : mains failure detection

* only for 120/230V version
** only in 2 channel + matrix version

Information indicator on connectors:

1262	1263	1261 to 1325
1: +5.6V	1: ab	1: ab
2: GNDD	2: PD	2: DC
3: +12M	3: -30	3: AMP OFF
4: GNDA	4: F2	4: L
5: +12A	5: F1	5: GND
6: AMP ON	6: ST.BY	6: R
7: Rin	7: CLIP	7: HST1
8: GND	8: NTC	8: NC
9: Lin		

11 to 3	1911 to 8	1914 to 14	1912 to 10	1909
1: + VH	1: AC2	1: AC2	1: F1	1: 0VA
2: + VL	2: AC1	2: AC1	2: F2	2: 120VB
3: GNDL	3: GND	3: GND	3: NTC	3: 10VB
4: GND	4: AC1'	4: AC1'	4: GND	4: 0VB
5: GNDR	5: AC2'	5: AC2'		
6: - VL				
7: - VH				

1265	1326 to 22	1328 to 16	1913 to 9	1258 to 27
1 : +	1: Surround	1: Left	1: AC3	1: REL
2: -	2: GND	2: GND	2: AC4	2: MFD
	3: Center	3: Right	3: AC5	3: +V
				4: GND

PS & L/R AMP. BOARD LAYOUT

9362 A 1
9363 A 1
9364 A 3

9307 B 7
9308 B 7
9309 B 6
9312 A 7
9313 A 5
9314 A 7
9315 B 6
9316 C 9
----
16 A 3
1327 A 3
2357 A 3
3381 A 3
9360 A 1
9361 A 1

9292 C 8
9293 A 9
9294 C 5
9295 C 5
9296 C 5
9297 D 5
9298 D 6
9299 A 8
9300 B 8
9301 B 8
9302 A 8
9303 B 8
9304 B 9
9305 A 7
9306 B 8

9271 D 8
9273 D 9
9275 C 7
9277 B 8
9278 D 6
9279 D 7
9281 C 7
9284 C 8
9285 C 8
9286 C 6
9287 C 7
9288 C 7
9289 B 8
9290 B 7
9291 C 6

9254 B 5
9255 B 5
9256 D 8
9257 D 5
9258 A 5
9259 B 6
9260 A 7
9261 A 9
9262 A 5
9265 D 8
9266 D 9
9267 D 8
9268 D 9
9269 D 9
9270 A 7

7281 D 8
7282 B 7
7283 A 7
7284 A 8
7286 B 7
7290 C 5
7291 C 5
7292 D 9
7293 D 5
7294 D 5
7297 C 5
8328 C 7
9251 D 6
9252 D 6
9253 D 9

6300 C 5
6301 A 8
6302 B 5
7251 D 9
7252 B 8
7253 A 6
7254 C 9
7255 B 9
7260 A 6
7262 A 9
7263 A 9
7265 A 5
7266 B 5
7268 A 5
7280 A 9

6284 B 7
6285 B 6
6286 B 6
6287 B 6
6288 B 6
6289 B 7
6291 D 5
6292 D 5
6293 B 9
6294 B 9
6295 A 7
6296 A 6
6297 A 6
6298 B 5
6299 B 5

3320 A 5
6251 D 7
6252 B 9
6253 D 5
6255 D 6
6260 C 9
6261 C 9
6262 C 9
6263 C 9
6264 B 8
6265 A 9
6267 A 9
6269 B 8
6281 D 8
6283 B 8

3302 B 5
3303 D 9
3304 B 6
3305 B 6
3306 A 6
3307 B 9
3308 A 8
3310 A 7
3311 A 8
3312 A 6
3313 B 9
3315 A 6
3316 A 6
3318 A 7
3319 A 5

3287 B 8
3288 B 7
3289 B 7
3290 D 6
3291 C 5
3292 C 5
3293 C 5
3294 C 5
3295 C 5
3296 C 5
3297 C 5
3298 C 5
3299 C 5
3300 C 5
3301 B 5

3270 C 9
3271 C 5
3273 D 5
3274 D 5
3275 D 5
3276 D 5
3277 D 5
3279 D 8
3280 A 9
3281 B 9
3282 C 5
3283 C 8
3284 C 8
3285 B 7
3286 B 7

3255 D 9
3256 A 9
3257 D 9
3258 D 9
3259 B 8
3260 C 8
3261 B 8
3262 B 8
3263 B 8
3264 B 8
3265 B 8
3266 A 6
3267 A 6
3268 A 7
3269 A 9

2287 B 7
2288 A 9
2289 A 9
2290 C 5
2291 C 5
2292 C 5
2295 C 9
2300 B 5
2301 B 5
2302 A 6
2303 A 5
3251 C 9
3252 C 9
3253 A 9
3254 B 5

2264 C 9
2265 B 9
2266 B 9
2267 C 9
2268 C 8
2269 B 8
2270 B 7
2271 A 8
2279 C 8
2280 C 9
2281 C 9
2282 C 8
2283 A 8
2284 B 5
2285 B 6

1290 D 8
1291 C 6
2251 D 7
2252 D 7
2253 C 7
2254 D 7
2255 D 7
2256 C 7
2257 C 6
2258 C 6
2259 C 7
2260 C 8
2261 C 8
2262 C 8
2263 B 9

9357 C 3
----
8 C 7
9 B 9
10 B 7
11 C 6
14 C 7
1258 A 9
1261 B 5
1262 A 8
1263 A 5
1264 A 7
1265 B 6
1268 D 9
1280 B 5

9341 D 4
9342 C 3
9343 B 1
9344 C 2
9345 B 3
9346 C 3
9347 B 1
9348 B 3
9349 B 1
9350 C 1
9351 C 4
9353 C 4
9354 B 1
9355 B 3
9356 C 4

9323 B 2
9324 B 2
9325 C 2
9326 C 3
9327 C 2
9328 C 2
9329 B 2
9331 C 4
9332 A 4
9333 B 4
9335 D 3
9336 D 2
9337 D 2
9338 D 3
9340 B 2

6337 C 1
6339 C 1
6360 C 3
7323 C 1
7324 C 1
7325 D 1
7326 D 1
7327 C 1
7328 B 1
7329 C 3
7330 C 3
7350 C 1
8327 D 3
9321 B 1
9322 B 1

3385 B 3
5321 B 4
5322 D 4
5323 B 4
5324 D 4
6325 B 2
6326 B 3
6327 B 3
6328 B 2
6329 B 3
6330 B 2
6333 D 3
6334 D 3
6335 D 3
6336 D 3

3366 C 3
3367 C 1
3368 C 1
3369 B 4
3370 D 4
3371 D 2
3372 D 2
3373 B 1
3376 B 1
3377 A 4
3378 B 4
3379 B 4
3380 B 4
3383 C 1
3384 C 1

3345 D 1
3346 D 1
3347 D 1
3348 D 1
3350 C 1
3351 C 1
3352 C 1
3353 C 1
3355 B 2
3356 B 2
3357 D 1
3358 D 1
3363 B 4
3364 D 4
3365 C 3

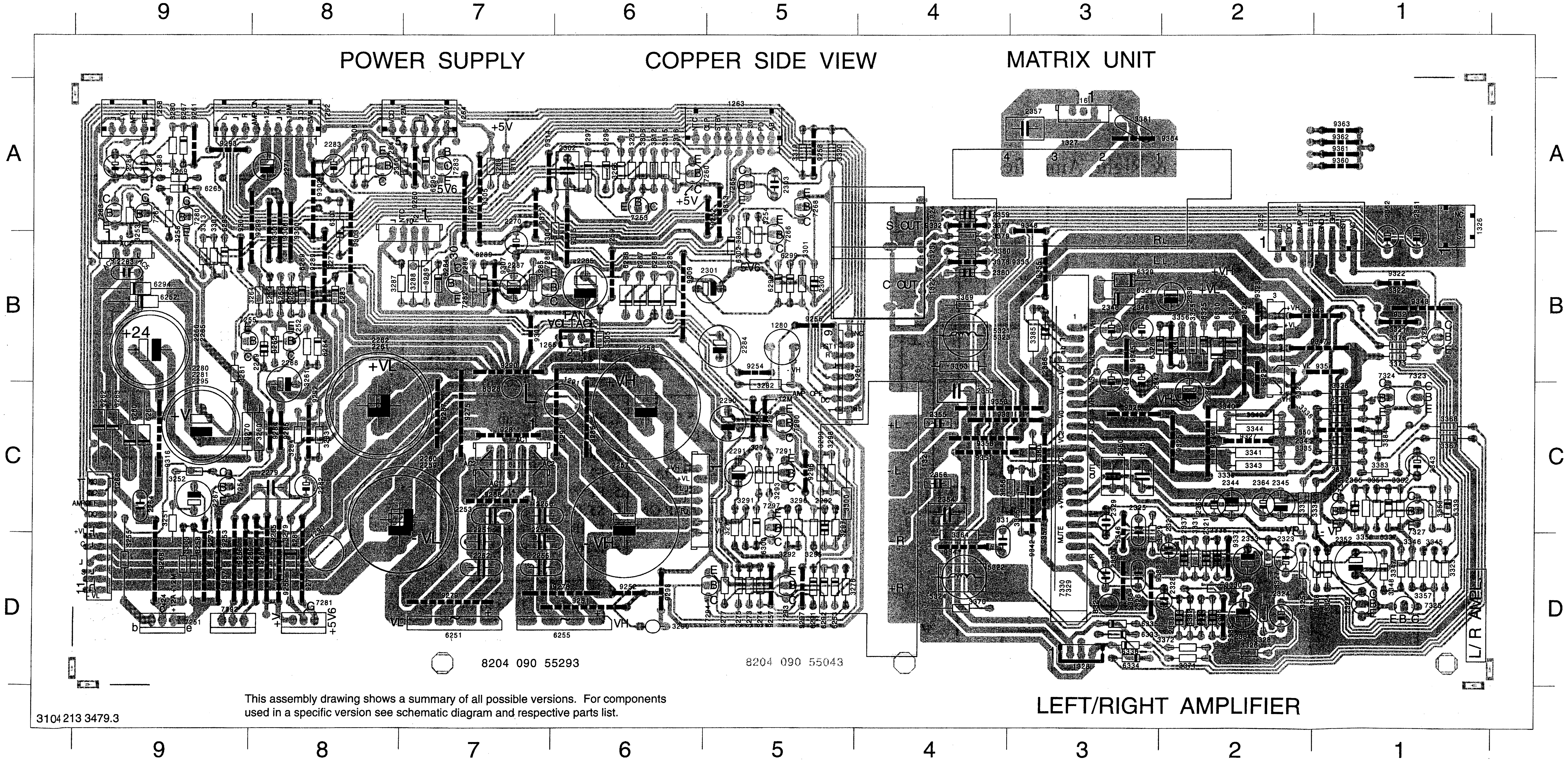
3330 D 2
3331 D 2
3332 D 2
3333 C 2
3334 C 1
3335 C 1
3336 C 1
3337 C 1
3338 C 1
3339 C 2
3340 C 2
3341 C 2
3342 C 2
3343 C 2
3344 C 2

2361 B 1
2362 B 1
2363 C 2
2364 C 2
2365 C 1
2366 B 3
3321 B 1
3322 B 1
3323 D 1
3324 D 1
3325 D 2
3326 D 2
3327 D 2
3328 D 2
3329 D 3

2344 C 2
2345 C 2
2346 B 3
2347 B 3
2348 B 3
2349 B 3
2350 C 3
2351 C 3
2352 D 1
2353 C 4
2354 C 4
2355 C 4
2356 C 4
2359 A 4
2360 B 4

2328 D 2
2329 C 3
2330 D 3
2331 D 4
2333 D 2
2334 D 2
2335 D 2
2336 D 2
2337 D 2
2338 D 2
2339 B 2
2340 C 2
2341 C 1
2342 C 1
2343 C 1

3 B 2
1321 C 4
1322 B 4
1323 B 4
1324 A 4
1325 B 1
1326 A 1
1328 D 3
2321 D 2
2322 D 2
2323 D 2
2324 D 2
2325 C 3
2326 D 3
2327 D 2



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

MAINS BOA

trf5 D 3
trf6 C 3
trf7 C 3
trf8 C 3

1911 A 3
1912 B 3
1913 B 3
1914 A 3
1920 A 3
1921 A 3
1922 A 3
1923 B 3
1924 B 3
1925 C 3
3920 B 3
9930 B 3
9931 A 3
9932 A 3
9933 A 3
9934 A 3
9935 A 3
9936 B 3
9937 B 3
9938 B 3
9939 B 3
9940 B 3
9941 B 3
9942 C 3
trf10 A 3
trf11 A 3
trf12 A 3
trf13 A 3
trf14 A 3
trf15 B 3
trf16 B 3
trf17 B 3
trf18 B 3
trf19 B 3
trf20 B 3
trf21 C 3

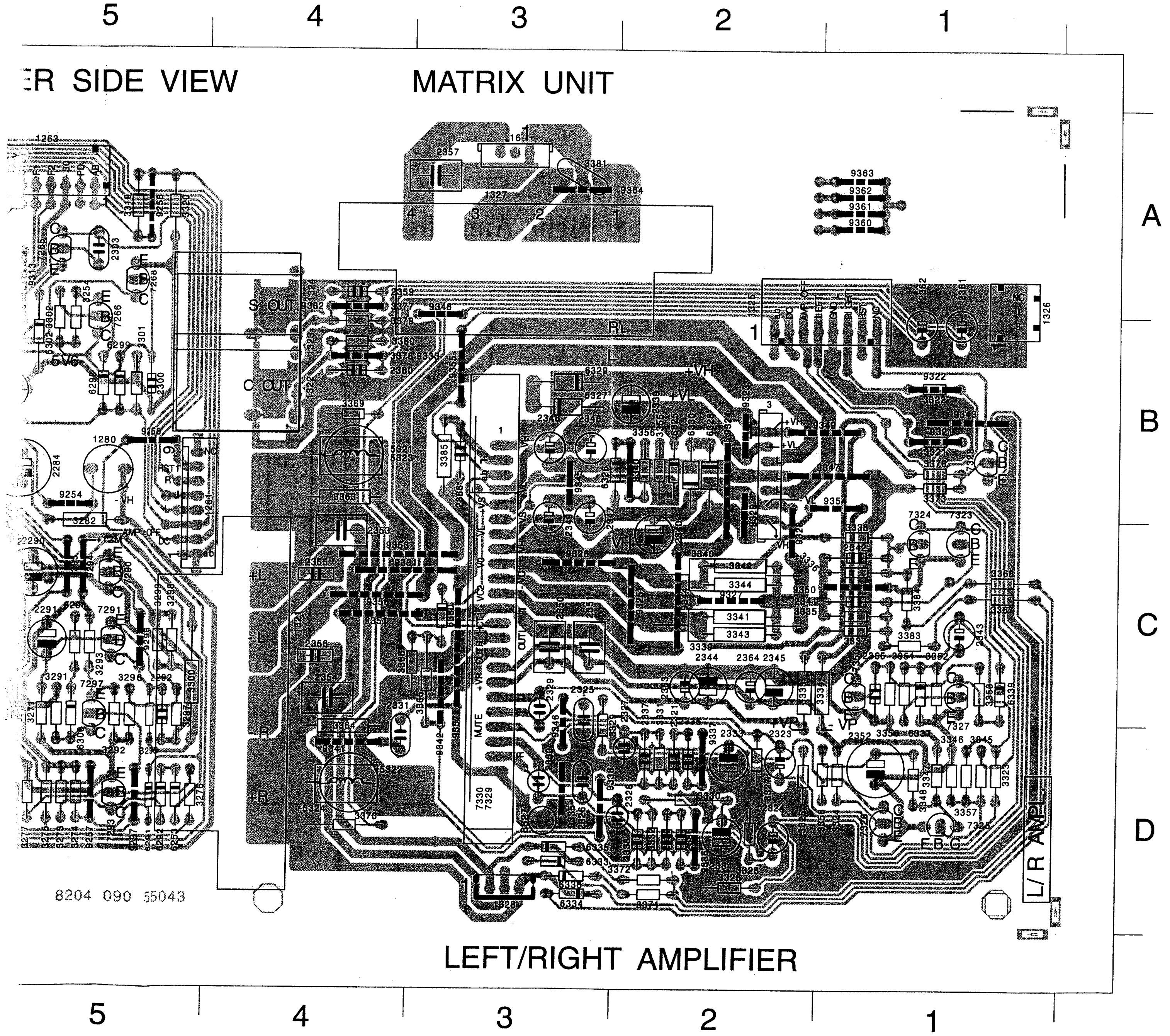
27 B 1
1901 D 2
1902 D 1
1905 C 2
1906 C 1
1907 D 1
1909 C 1
1910 C 1
2902 A 2
2903 A 2
2904 A 1
2905 A 1
2906 B 1
3901 B 1
3902 A 1
3903 A 1
3904 A 1
3905 A 1
3906 A 1

5901 C 2
5902 C 2
5903 B 2
5904 B 2
5905 B 1
6901 A 2
6902 A 2
6903 A 2
6904 A 2
6905 A 2
6906 A 1
6908 B 1
6909 A 1
6910 A 1
6911 B 1
6912 B 1
7901 A 1
7902 A 1
9901 C 2
9902 C 2
9903 C 2
9904 C 1
9905 C 1
9906 D 1
9907 B 2
9908 B 2
9909 B 2
9910 A 1
9911 A 1
9912 A 1
9913 A 1
9914 A 1
9915 C 1
9916 C 2
9917 C 1
9918 C 2

8901 D 3
8902 C 3
9920 D 3
9921 D 3
9922 D 3
9923 C 3
9924 C 3
9925 C 3
trf3 D 3
trf4 D 3

A
B
C
D

3255 D 9
3256 A 9
3257 D 9
3258 D 9
3259 B 8
3260 C 8
3261 B 8
3262 B 8
3263 B 8
3264 B 8
3265 B 8
3266 A 6
3267 A 6
3268 A 7
3269 A 9
2287 B 7
2288 A 9
2289 A 9
2290 C 5
2291 C 5
2292 C 5
2295 C 9
2300 B 5
2301 B 5
2302 A 6
2303 A 5
3251 C 9
3252 C 9
3253 A 9
3254 B 5
2264 C 9
2265 B 9
2266 B 9
2267 C 9
2268 C 8
2269 B 8
2270 B 7
2271 A 8
2279 C 8
2280 C 9
2281 C 9
2282 C 8
2283 A 8
2284 B 5
2285 B 6
1290 D 8
1291 C 6
2251 D 7
2252 D 7
2253 C 7
2254 D 7
2255 D 7
2256 C 7
2257 C 6
2258 C 6
2259 C 7
2260 C 8
2261 C 8
2262 C 8
2263 B 9
9357 C 3
----
8 C 7
9 B 9
10 B 7
11 C 6
14 C 7
1258 A 9
1261 B 5
1262 A 8
1263 A 5
1264 A 7
1265 B 6
1268 D 9
1280 B 5
9341 D 4
9342 C 3
9343 B 1
9344 C 2
9345 B 3
9346 C 3
9347 B 1
9348 B 3
9349 B 1
9350 C 1
9351 C 4
9353 C 4
9354 B 1
9355 B 3
9356 C 4
9323 B 2
9324 B 2
9325 C 2
9326 C 3
9327 C 2
9328 C 2
9329 B 2
9331 C 4
9332 A 4
9333 B 4
9335 D 3
9336 D 2
9337 D 2
9338 D 3
9340 B 2
6337 C 1
6339 C 1
6360 C 3
7323 C 1
7324 C 1
7325 D 1
7326 D 1
7327 C 1
7328 B 1
7329 C 3
7330 C 3
7350 C 1
8327 D 3
9321 B 1
9322 B 1
3385 B 3
5321 B 4
5322 D 4
5323 B 4
5324 D 4
6325 B 2
6326 B 3
6327 B 3
6328 B 2
6329 B 3
6330 B 2
6333 D 3
6334 D 3
6335 D 3
6336 D 3
3366 C 3
3367 C 1
3368 C 1
3369 B 4
3370 D 4
3371 D 2
3372 D 2
3373 B 1
3376 B 1
3377 A 4
3378 B 4
3379 B 4
3380 B 4
3383 C 1
3384 C 1
3345 D 1
3346 D 1
3347 D 1
3348 D 1
3350 C 1
3351 C 1
3352 C 1
3353 C 1
3355 B 2
3356 B 2
3357 D 1
3358 D 1
3363 B 4
3364 D 4
3365 C 3
3330 D 2
3331 D 2
3332 D 2
3333 C 2
3334 C 1
3335 C 1
3336 C 1
3337 C 1
3338 C 1
3339 C 2
3340 C 2
3341 C 2
3342 C 2
3343 C 2
3344 C 2
2361 B 1
2362 B 1
2363 C 2
2364 C 2
2365 C 1
2366 B 3
3321 B 1
3322 B 1
3323 D 1
3324 D 1
3325 D 2
3326 D 2
3327 D 2
3328 D 2
3329 D 3
2344 C 2
2345 C 2
2346 B 3
2347 B 3
2348 B 3
2349 B 3
2350 C 3
2351 C 3
2352 D 1
2353 C 4
2354 C 4
2355 C 4
2356 C 4
2359 A 4
2360 B 4
2328 D 2
2329 C 3
2330 D 3
2331 D 4
2333 D 2
2334 D 2
2335 D 2
2336 D 2
2337 D 2
2338 D 2
2339 B 2
2340 C 2
2341 C 1
2342 C 1
2343 C 1
3 B 2
1321 C 4
1322 B 4
1323 B 4
1324 A 4
1325 B 1
1326 A 1
1328 D 3
2321 D 2
2322 D 2
2323 D 2
2324 D 2
2325 C 3
2326 D 3
2327 D 2



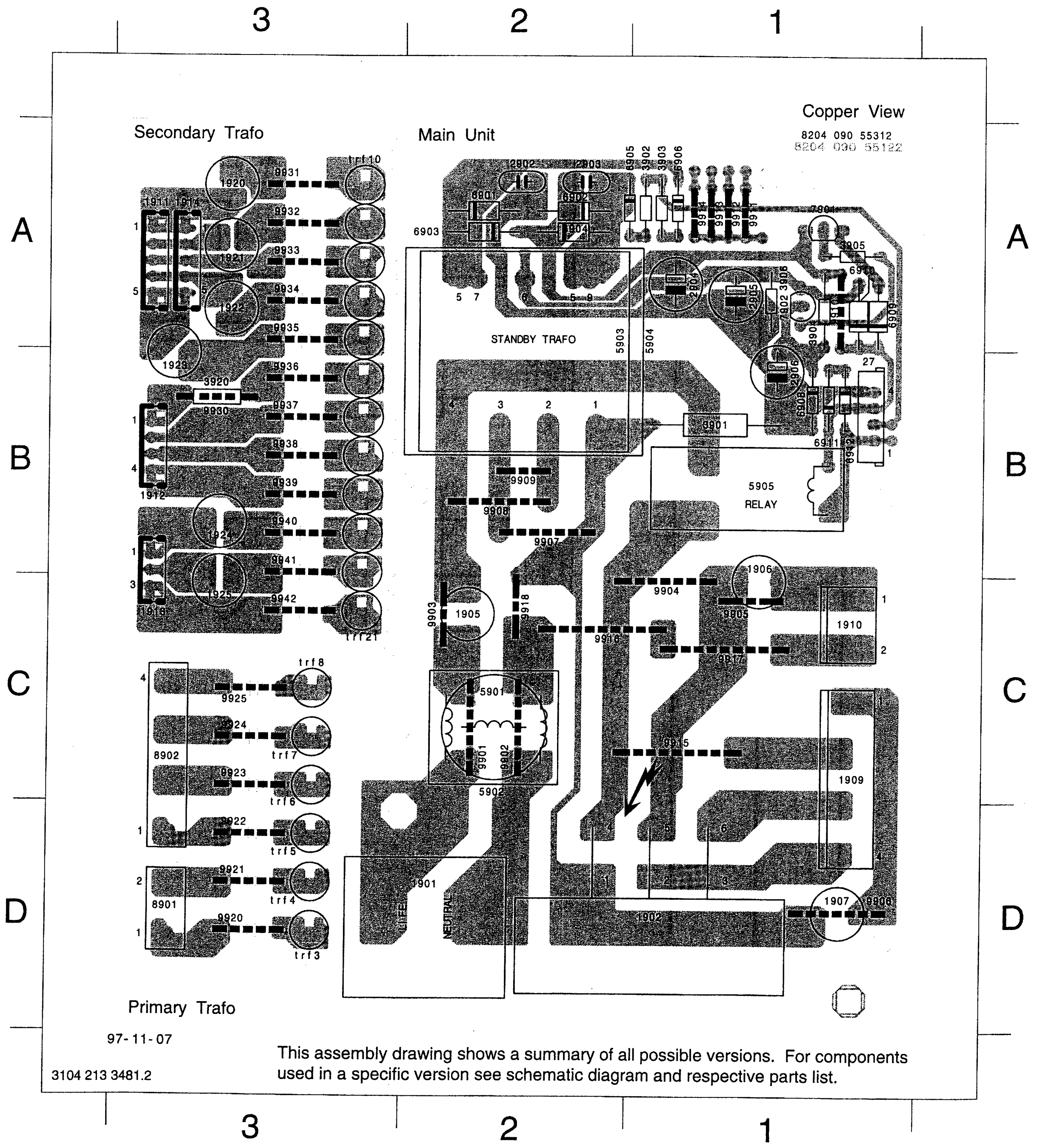
MAINS BOARD LAYOUT

trf5 D 3
trf6 C 3
trf7 C 3
trf8 C 3

1911 A 3
1912 B 3
1913 B 3
1914 A 3
1920 A 3
1921 A 3
1922 A 3
1923 B 3
1924 B 3
1925 C 3
3920 B 3
9930 B 3
9931 A 3
9932 A 3
9933 A 3
9934 A 3
9935 A 3
9936 B 3
9937 B 3
9938 B 3
9939 B 3
9940 B 3
9941 B 3
9942 C 3
trf10 A 3
trf11 A 3
trf12 A 3
trf13 A 3
trf14 A 3
trf15 B 3
trf16 B 3
trf17 B 3
trf18 B 3
trf19 B 3
trf20 B 3
trf21 C 3
27 B 1
1901 D 2
1902 D 1
1905 C 2
1906 C 1
1907 D 1
1909 C 1
1910 C 1
2902 A 2
2903 A 2
2904 A 1
2905 A 1
2906 B 1
3901 B 1
3902 A 1
3903 A 1
3904 A 1
3905 A 1
3906 A 1

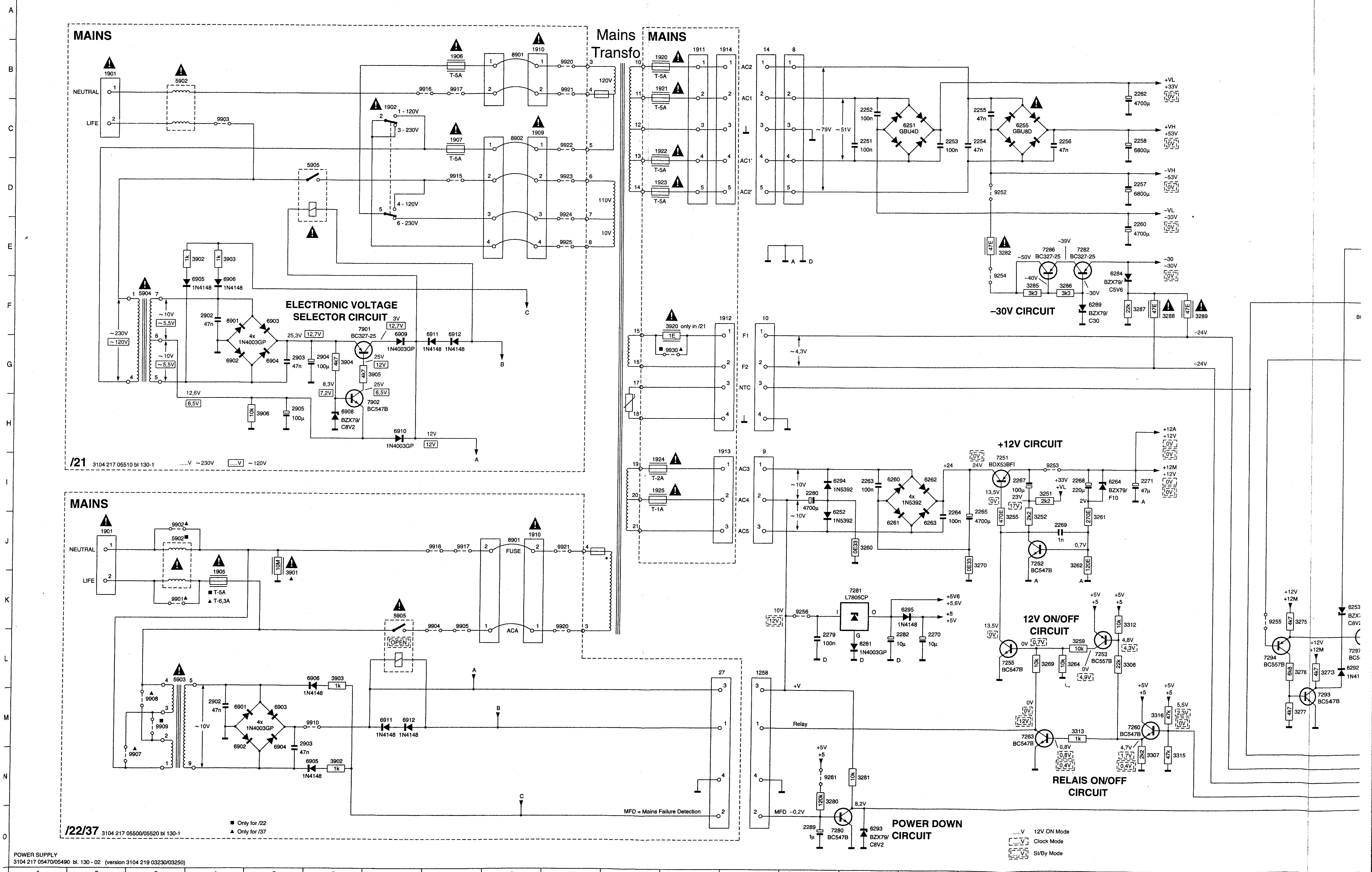
5901 C 2
5902 C 2
5903 B 2
5904 B 2
5905 B 1
6901 A 2
6902 A 2
6903 A 2
6904 A 2
6905 A 2
6906 A 1
6908 B 1
6909 A 1
6910 A 1
6911 B 1
6912 B 1
7901 A 1
7902 A 1
9901 C 2
9902 C 2
9903 C 2
9904 C 1
9905 C 1
9906 D 1
9907 B 2
9908 B 2
9909 B 2
9910 A 1
9911 A 1
9912 A 1
9913 A 1
9914 A 1
9915 C 1
9916 C 2
9917 C 1
9918 C 2

8901 D 3
8902 C 3
9920 D 3
9921 D 3
9922 D 3
9923 C 3
9924 C 3
9925 C 3
trf3 D 3
trf4 D 3

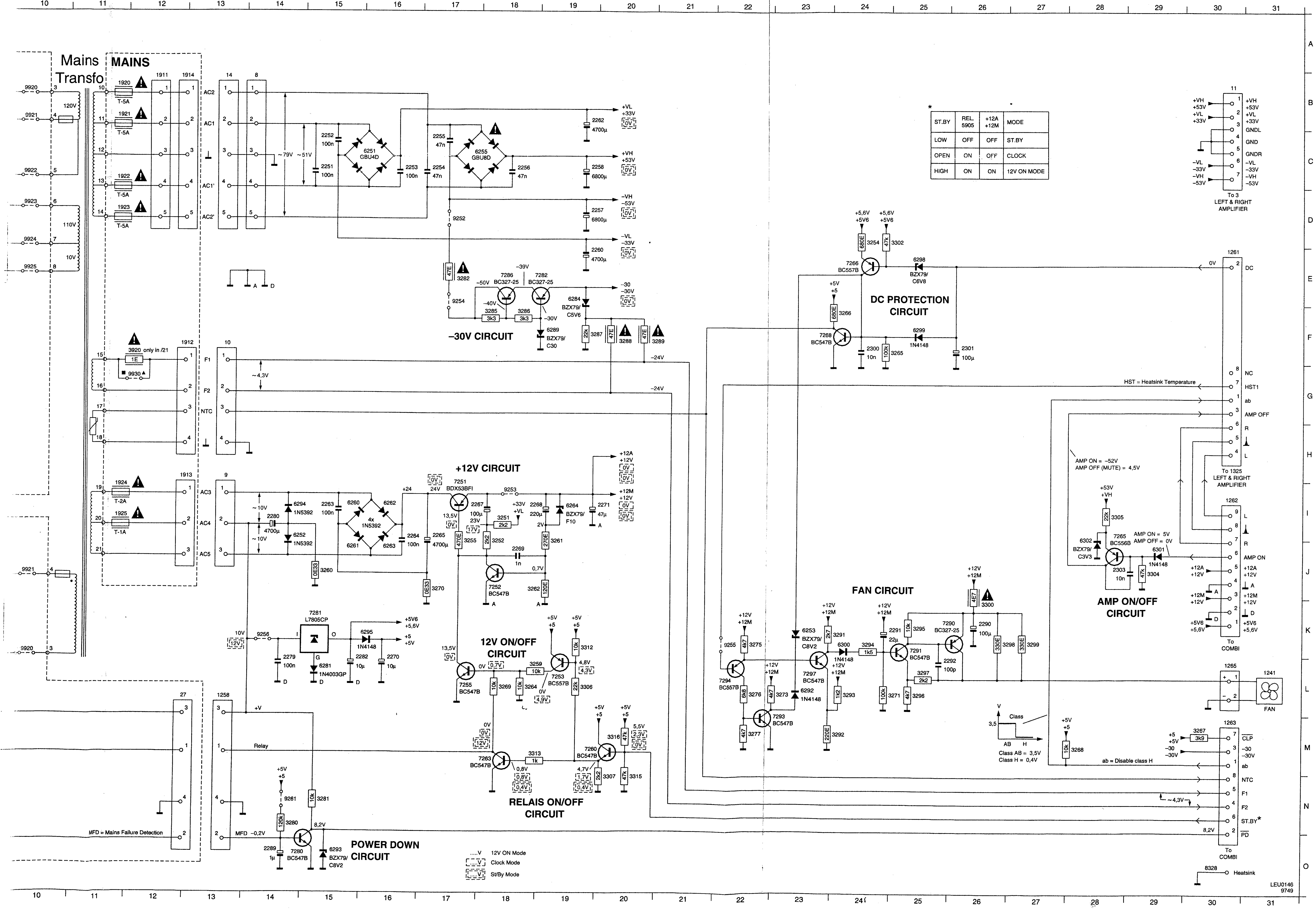


This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

POWER SUPPLY 2x 130W (+MTX)


MAINS
Mains Transfo
MAINS
NEUTRAL
LIFE
1901
5902
9903
1906 T-5A
1910
8901
1902 1 - 120V 3 - 230V
1907 T-5A
1909
8902
5905
4 - 120V
6 - 230V
120V
110V
10V
9916 9917 9920 9921 9922 9915 9923 9924 9925
3902 3903
6905 1N4148
6906 1N4148
5904
~230V
~120V
~10V
~5,5V
2902 47n
6901 6903 6902 6904
4x 1N4003GP
ELECTRONIC VOLTAGE SELECTOR CIRCUIT
25,3V 12,7V
7901 BC327-25
6909 1N4003GP
6911 6912 1N4148 1N4148
2903 47n
2904 100µ
3904 4k7
3905 4k7
7902 BC547B
6908 BZX79/ C8V2
3906 10k
2905 100µ
12,6V 6,5V
8,3V 7,2V
25V 12V
25V 6,5V
6910 1N4003GP
12V 12V
/21 3104 217 05510 bl 130-1
....V ~230V
....V ~120V
1920 T-5A
1921 T-5A
1922 T-5A
1923 T-5A
1911 1914
AC2 AC1 AC1' AC2'
~79V ~51V
2252 100n
2251 100n
6251 GBU4D
2253 100n
2255 47n
2254 47n
6255 GBU8D
2256 47n
2262 4700µ
2258 6800µ
2257 6800µ
2260 4700µ
+VL +33V 0V
+VH +53V 0V
-VH -53V 0V
-VL -33V 0V
9252
3282 47E
7286 BC327-25
7282 BC327-25
-39V
-50V
-40V
3285 3k3
3286 3k3
-30V
6284 BZX79/ C5V6
6289 BZX79/ C30
-30 -30V 0V
-30V CIRCUIT
3287 22k
3288 47E
3289 47E
-24V
3920 only in /21 1E
9930
1912
F1 F2 NTC
~4,3V
1924 T-2A
1925 T-1A
1913
AC3 AC4 AC5
~10V
6294 1N5392
2280 4700µ
6252 1N5392
3260 0E33
2263 100n
6260 6262 6261 6263
4x 1N5392
2264 100n
2265 4700µ
3270 0E33
+12V CIRCUIT
7251 BDX53BFI
+24 24V
13,5V 0V
2267 100µ
23V 17V
3251 2k2
3252 2k2
3255 470E
9253
2268 220µ
6264 BZX79/ F10
2271 47µ
+12A +12V 0V
+12M +12V 0V
2269 1n
7252 BC547B
3262 120E
3261 270E
0,7V
7281 L7805CP
10V 12V
9256
2279 100n
6281 1N4003GP
6295 1N4148
2282 10µ
2270 10µ
+5V6 +5,6V
+5 +5V
12V ON/OFF CIRCUIT
7255 BC547B
3269 10k
3259 10k
3264 10k
7253 BC557B
3312 10k
3306 22k
4,8V 4,3V
0V 0,7V
0V 4,9V
7263 BC547B
3313 1k
7260 BC547B
3316 4k7
3307 2k2
3315 47k
5,5V 2,3V 0V
4,7V 1,7V 0,4V
0,8V 0,8V 0,4V
RELAIS ON/OFF CIRCUIT
MAINS
1901
NEUTRAL
LIFE
9902
5902
9901
1905 T-5A T-6,3A
3901 10M
8901 FUSE
1910
ACA
5905 OPEN
9904 9905 9920
5903
9908 9909 9907
~10V
2902 47n
6901 6903 6902 6904
4x 1N4003GP
2903 47n
6906 1N4148 3903 1k
6905 1N4148 3902 1k
9910
6911 6912 1N4148 1N4148
27
MFD = Mains Failure Detection
/22/37 3104 217 05500/05520 bl 130-1
■ Only for /22
▲ Only for /37
1258
+V
Relay
MFD -0,2V
9261
3280 120k
3281 10k
2289 1µ
7280 BC547B
6293 BZX79/ C8V2
8,2V
POWER DOWN CIRCUIT
....V 12V ON Mode
....V Clock Mode
....V St/By Mode
9255
3275 4k7
7294 BC557B
3276 6k8
3277 4k7
3273 4k7
7293 BC547B
6253 BZX
6292 1N41

POWER SUPPLY
3104 217 05470/05490 bl. 130 - 02 (version 3104 219 03230/03250)

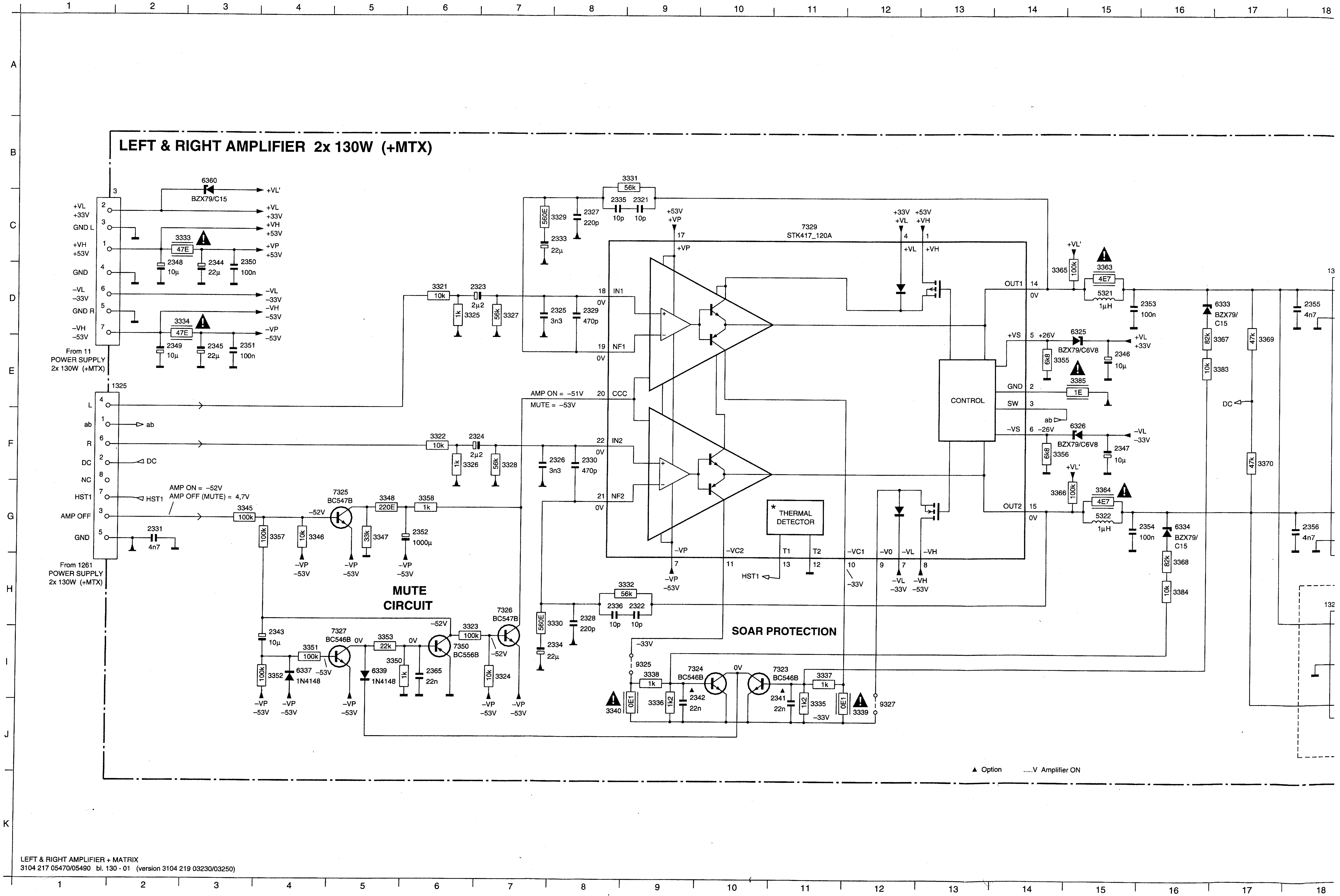

Mains Transfo
MAINS
T-5A
T-2A
T-1A
120V
110V
10V
AC1
AC2
AC1'
AC2'
AC3
AC4
AC5
F1
F2
NTC
3920 only in /21
~79V
~51V
~4,3V
6251 GBU4D
6255 GBU8D
+VL +33V
+VH +53V
–VH –53V
–VL –33V
–30V CIRCUIT
+12V CIRCUIT
12V ON/OFF CIRCUIT
RELAIS ON/OFF CIRCUIT
POWER DOWN CIRCUIT
MFD = Mains Failure Detection
DC PROTECTION CIRCUIT
FAN CIRCUIT
AMP ON/OFF CIRCUIT
AMP ON = –52V
AMP OFF (MUTE) = 4,5V
AMP ON = 5V
AMP OFF = 0V
HST = Heatsink Temperature
ab = Disable class H
Class AB = 3,5V
Class H = 0,4V
To 3 LEFT & RIGHT AMPLIFIER
To 1325 LEFT & RIGHT AMPLIFIER
To COMBI
FAN
Heatsink
....V 12V ON Mode
[...V] Clock Mode
[...V] St/By Mode
LEU0146 9749

ST.BY	REL. 5905	+12A +12M	MODE
LOW	OFF	OFF	ST.BY
OPEN	ON	OFF	CLOCK
HIGH	ON	ON	12V ON MODE

8	B14		
9	H13	3920	F11
10	F13	5902	J3
11	B30	5902	B3
14	B13	5903	L3
27	L12	5904	F3
1241	L31	5905	D5
1258	L13	5905	K7
1261	E30	6251	C15
1262	I30	6252	I14
1263	M30	6253	K23
1265	L30	6255	C17
1901	J2	6260	I15
1901	B2	6261	J15
1902	C7	6262	I16
1905	K4	6263	J16
1906	B8	6264	I19
1907	C8	6281	L15
1909	C9	6284	E19
1910	J9	6289	F19
1910	B9	6292	L23
1911	B12	6293	O15
1912	F12	6294	I14
1913	H12	6295	K15
1914	B12	6298	E25
1920	B11	6299	F25
1921	B11	6300	K24
1922	C11	6301	J29
1923	D11	6302	J28
1924	I11	6901	F4
1925	I11	6901	M4
2251	C15	6902	G4
2252	C15	6902	N4
2253	C16	6903	F5
2254	C17	6903	M5
2255	C17	6904	G5
2256	C18	6904	N5
2257	D19	6905	N6
2258	C19	6905	F4
2260	E19	6906	L6
2262	B19	6906	F4
2263	I15	6908	H6
2264	I16	6909	F7
2265	I17	6910	H7
2267	I17	6911	M7
2268	I18	6911	F7
2269	J18	6912	M7
2270	L16	6912	F8
2271	I20	7251	I17
2279	L14	7252	J18
2280	I14	7253	L19
2282	L15	7255	L17
2289	O14	7260	M19
2290	K26	7263	M18
2291	K24	7265	I28
2292	L25	7266	E24
2300	F24	7268	F23
2301	F26	7280	O14
2303	J28	7281	K15
2902	F4	7282	E18
2902	M4	7286	E18
2903	G5	7290	K25
2903	M5	7291	K25
2904	G6	7293	M23
2905	H5	7294	L22
3251	I18	7297	L23
3252	J18	7901	F6
3254	D24	7902	H6
3255	J17	8328	O30
3259	L18	8901	J9
3260	J15	8901	B9
3261	J19	8902	C9
3262	J18	9252	D17
3264	L18	9253	I18
3265	F24	9254	E17
3266	F24	9255	K22
3267	M30	9256	K14
3268	M28	9261	N14
3269	L18	9901	K3
3270	J17	9902	J3
3271	L24	9903	C4
3273	L23	9904	K8
3275	K22	9905	K8
3276	L22	9907	N3
3277	M22	9908	M3
3280	N14	9909	M3
3281	N15	9910	M6
3282	E17	9915	D8
3285	F18	9916	B7
3286	F18	9916	J8
3287	F19	9917	B8
3288	F20	9917	J8
3289	F20	9920	B10
3291	K24	9920	K10
3292	M24	9921	J10
3293	L24	9921	B10
3294	K24	9922	C10
3295	K25	9923	D10
3296	L25	9924	D10
3297	L25	9925	E10
3298	K26	9930	G11
3299	K27		
3300	K26		
3302	D24		
3304	J29		
3305	I28		
3306	L19		
3307	N20		
3312	K19		
3313	M18		
3315	N20		
3316	M20		
3901	K5		
3902	N6		
3902	E3		
3903	L6		
3903	E4		
3904	G6		
3905	G6		
3906	H5		

3	C1
16	H19
1321	D18
1325	E1
1327	H19
1328	H18
2321	C9
2322	H9
2323	D6
2324	F6
2325	D7
2326	F7
2327	C8
2328	H8
2329	D8
2330	F8
2331	G2
2333	C7
2334	I7
2335	C8
2336	H8
2341	I11
2342	I9
2343	I4
2344	D3
2345	E3
2346	E15
2347	F15
2348	D2
2349	E2
2350	D3
2351	E3
2352	G6
2353	D16
2354	G16
2355	D18
2356	G18
2365	I6
3321	D6
3322	F6
3323	I6
3324	I7
3325	D6
3326	F6
3327	D7
3328	F7
3329	C7
3330	H7
3331	B8
3332	H8
3333	C2
3334	D2
3335	J11
3336	J9
3337	I11
3338	I9
3339	J12
3340	J8
3345	G3
3346	G4
3347	G5
3348	G5
3350	I5
3351	I4
3352	I4
3353	I5
3355	E14
3356	F14
3357	G4
3358	G6
3363	D15
3364	G15
3365	D14
3366	G14
3367	E17
3368	H16
3369	E17
3370	F17
3383	E17
3384	H16
3385	E15
5321	D15
5322	G15
6325	D15
6326	F15
6333	D17
6334	G16
6337	I4
6339	I5
6360	B3
7323	I11
7324	I9
7325	G5
7326	H7
7327	I5
7329	C11
7350	I6
9325	I9
9327	J12

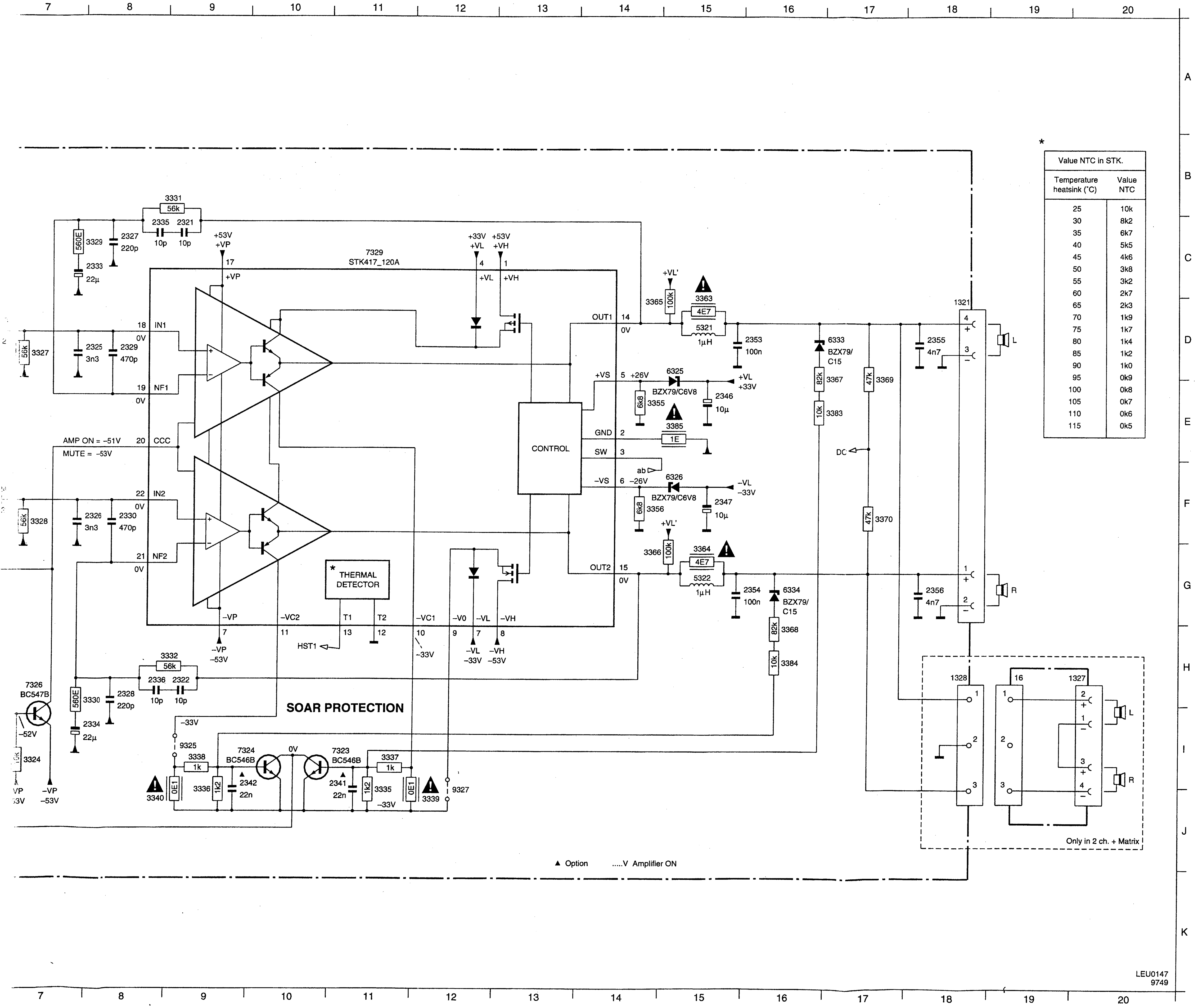
LEFT & RIGHT AMPLIFIER 2x 130W (+MTX)


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
A
B
C
D
E
F
G
H
I
J
K
3
+VL
+33V
GND L
+VH
+53V
GND
-VL
-33V
GND R
-VH
-53V
From 11
POWER SUPPLY
2x 130W (+MTX)
6360
BZX79/C15
+VL'
+VL
+33V
+VH
+53V
3333
47E
2348
10µ
2344
22µ
2350
100n
+VP
+53V
-VL
-33V
-VH
-53V
3334
47E
2349
10µ
2345
22µ
2351
100n
-VP
-53V
1325
L
ab
R
DC
NC
HST1
AMP OFF
GND
ab
DC
HST1
AMP ON = -52V
AMP OFF (MUTE) = 4,7V
2331
4n7
From 1261
POWER SUPPLY
2x 130W (+MTX)
3321
10k
2323
2µ2
3325
1k
3327
56k
3322
10k
2324
2µ2
3326
1k
3328
56k
3345
100k
3357
100k
3346
10k
7325
BC547B
-52V
3348
220E
3358
1k
3347
33k
2352
1000µ
-VP
-53V
MUTE
CIRCUIT
2343
10µ
7327
BC546B
0V
3351
100k
3352
100k
6337
1N4148
-53V
3353
22k
3350
1k
6339
1N4148
2365
22n
7350
BC556B
-52V
3323
100k
7326
BC547B
3324
10k
3331
56k
2335
10p
2321
10p
3329
560E
2327
220p
2333
22µ
2325
3n3
2329
470p
2326
3n3
2330
470p
AMP ON = -51V
MUTE = -53V
18 IN1
0V
19 NF1
20 CCC
22 IN2
21 NF2
+53V
+VP
17
7329
STK417_120A
+33V
+VL
+53V
+VH
4
1
THERMAL
DETECTOR
CONTROL
-VP
-VC2
T1
T2
-VC1
-V0
-VL
-VH
7
11
13
12
10
9
8
HST1
-33V
-VL
-33V
-VH
-53V
3332
56k
2336
10p
2322
10p
3330
560E
2328
220p
2334
22µ
SOAR PROTECTION
9325
3338
1k
7324
BC546B
2342
22n
3336
1k2
3340
0E1
7323
BC546B
3337
1k
2341
22n
3335
1k2
3339
0E1
9327
OUT1 14
0V
+VS 5 +26V
GND 2
SW 3
-VS 6 -26V
OUT2 15
0V
3365
100k
3363
4E7
5321
1µH
2353
100n
6325
BZX79/C6V8
3355
6k8
2346
10µ
3385
1E
6326
BZX79/C6V8
3356
6k8
2347
10µ
3366
100k
3364
4E7
5322
1µH
2354
100n
6333
BZX79/
C15
3367
82k
3383
10k
6334
BZX79/
C15
3368
82k
3384
10k
3369
47k
3370
47k
DC
2355
4n7
2356
4n7
▲ Option
.....V Amplifier ON
132

LEFT & RIGHT AMPLIFIER + MATRIX
3104 217 05470/05490 bl. 130 - 01 (version 3104 219 03230/03250)

PCS 100 047

56	G18	3323	I6	3327	D7	3331	B8	3335	J11	3339	J12	3347	G5	3352	I4	3357	G4	3365	D14	3369	E17	3385	E15	6326	F15	6339	I5	7325	G5	7350	I6
65	I6	3324	I7	3328	F7	3332	H8	3336	J9	3340	J8	3348	G5	3353	I5	3358	G6	3366	G14	3370	F17	5321	D15	6333	D17	6360	B3	7326	H7	9325	I9
21	D6	3325	D6	3329	C7	3333	C2	3337	I11	3345	G3	3350	I5	3355	E14	3363	D15	3367	E17	3383	E17	5322	G15	6334	G16	7323	I11	7327	I5	9327	J12
22	F6	3326	F6	3330	H7	3334	D2	3338	I9	3346	G4	3351	I4	3356	F14	3364	G15	3368	H16	3384	H16	6325	D15	6337	I4	7324	I9	7329	C11		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A
B
C
D
E
F
G
H
I
J
K
3331
56k
2335
2321
10p
10p
560E
3329
2327
220p
2333
22µ
+53V
+VP
17
+VP
7329
STK417_120A
+33V
+VL
+53V
+VH
4
1
+VL
+VH
56k
3327
2325
3n3
2329
470p
18
IN1
0V
19
NF1
0V
AMP ON = –51V
MUTE = –53V
20
CCC
56k
3328
2326
3n3
2330
470p
22
IN2
0V
21
NF2
0V
CONTROL
THERMAL DETECTOR
–VP
–VC2
T1
T2
–VC1
–V0
–VL
–VH
7
11
13
12
10
9
7
8
–VP
–53V
HST1
–33V
–VL
–33V
–VH
–53V
OUT1
14
0V
+VS
5
+26V
GND
2
SW
3
ab
–VS
6
–26V
OUT2
15
0V
+VL'
3365
100k
3363
4E7
5321
1µH
2353
100n
6325
BZX79/C6V8
6k8
3355
2346
10µ
+VL
+33V
3385
1E
6326
BZX79/C6V8
6k8
3356
2347
10µ
–VL
–33V
+VL'
3366
100k
3364
4E7
5322
1µH
2354
100n
6333
BZX79/
C15
82k
3367
10k
3383
6334
BZX79/
C15
82k
3368
10k
3384
47k
3369
DC
47k
3370
1321
4
+
3
–
L
2355
4n7
1
+
2
–
R
2356
4n7
1328
1
2
3
16
1
2
3
1327
2
+
1
–
L
3
+
4
–
R
Only in 2 ch. + Matrix
3332
56k
2336
2322
10p
10p
7326
BC547B
560E
3330
2328
220p
2334
22µ
–52V
10k
3324
VP
3V
–VP
–53V
SOAR PROTECTION
–33V
9325
3338
1k
7324
BC546B
0V
7323
BC546B
3337
1k
3340
0E1
3336
1k2
2342
22n
2341
22n
1k2
3335
–33V
0E1
3339
9327
▲ Option
.....V Amplifier ON
LEU0147
9749

*

Value NTC in STK.	
Temperature heatsink (˚C)	Value NTC
25	10k
30	8k2
35	6k7
40	5k5
45	4k6
50	3k8
55	3k2
60	2k7
65	2k3
70	1k9
75	1k7
80	1k4
85	1k2
90	1k0
95	0k9
100	0k8
105	0k7
110	0k6
115	0k5

ELECTRICAL PARTS LIST - MAINS BOARD

MISCELLANEOUS

27	4822 265 30734		Connector 4 pin
1901	4822 265 31015	⚠	Mains Socket
1901#	4822 265 31016	⚠	Mains Socket
1902*	4822 272 10269	⚠	Voltage selector
1905^	4822 071 55002	⚠	Fuse T5A 250V
1905#	4822 252 51123	⚠	Fuse T6,3A 250V
1906*	4822 071 55002	⚠	Fuse T5A 250V
1907*	4822 071 55002	⚠	Fuse T5A 250V
1909*	4822 267 10728	⚠	Primary Connector 4 pin
1910	4822 265 20723	⚠	Primary Connector 2 pin
1911	4822 267 10734		Secondary Connector 5 pin
1912	4822 267 10565		Secondary Connector 4 pin
1913	4822 267 10735		Secondary Connector 3 pin
1914	4822 267 10734		Secondary Connector 5 pin
1920	4822 071 55002	⚠	Fuse T5A 250V
1921	4822 071 55002	⚠	Fuse T5A 250V
1922	4822 071 55002	⚠	Fuse T5A 250V
1923	4822 071 55002	⚠	Fuse T5A 250V
1924	4822 071 52502	⚠	Fuse T2,5A 250V
1925	4822 071 51602	⚠	Fuse T1,6A 250V

CAPACITORS

2902	4822 121 43526	47nF 5% 250V
2903	4822 121 43526	47nF 5% 250V
2904*	4822 124 40255	100µF 20% 63V
2905*	4822 124 81029	100µF 20% 25V

RESISTORS

3901#	4822 053 21106	⚠	10M 5% 0,5W
3902	4822 050 11002		1k 1% 0,4W
3903	4822 050 11002		1k 1% 0,4W
3904*	4822 116 52283		4k7 5% 0,5W
3905*	4822 116 52283		4k7 5% 0,5W
3906*	4822 116 83864		10k 5% 0,5W
3920*	4822 052 10108	⚠	1R 5% 0,33W

COILS & RELAYS

5902+	4822 157 10417	⚠	Mains Choke 6A
5903^	4822 146 10437	⚠	Standby Transformer
5904*	4822 146 10466	⚠	Standby Transformer
5905	4822 280 10299	⚠	Relay 1P 9V 15A

DIODES

6901	4822 130 31878	1N4003GP
6902	4822 130 31878	1N4003GP
6903	4822 130 31878	1N4003GP
6904	4822 130 31878	1N4003GP
6905	4822 130 30621	1N4148
6906	4822 130 30621	1N4148
6908*	4822 130 34382	BZX79-C8V2
6909*	4822 130 31878	1N4003GP
6910*	4822 130 31878	1N4003GP
6911	4822 130 30621	1N4148
6912	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7901*	4822 130 41246	BC327-25
7902*	4822 130 40959	BC547B

* For /21/21M only
^ Except for /21/21M
# For /37 only
+ Except for /37

Note: Only the parts mentioned in this list are normal service spare parts.

ELECTRICAL PARTS LIST - PS & L/R AMP. BOARD

MISCELLANEOUS

1258	4822 267 10567	Connector 4 pin
1261	4822 267 10745	Connector 8 pin Vert
1263	4822 267 10573	Connector 8 pin
1321	4822 267 31176	Loudspeaker Socket L/R
1325	4822 267 10747	Connector 8 pin
1327	4822 267 31176	Loudspeaker Socket Matrix
1328	4822 267 10735	Connector 3 pin Matrix

CAPACITORS

2251	5322 121 42578	100nF 5% 250V
2252	5322 121 42578	100nF 5% 250V
2253	5322 121 42578	100nF 5% 250V
2254	4822 121 43526	47nF 5% 250V
2255	4822 121 43526	47nF 5% 250V
2256	4822 121 43526	47nF 5% 250V
2257	4822 124 12132	6800µF 20% 63V
2258	4822 124 12132	6800µF 20% 63V
2260	4822 124 80415	4700µF 20% 50V
2262	4822 124 80415	4700µF 20% 50V
2263	5322 121 42386	100nF 5% 63V
2264	5322 121 42386	100nF 5% 63V
2265	4822 124 80563	4700µF 20% 35V
2267	4822 124 40255	100µF 20% 63V
2268	4822 124 22263	220µF 20% 25V
2269	4822 122 33197	1nF 10% 50V
2270	4822 124 41579	10µF 20% 50V
2271	4822 124 40433	47µF 20% 25V
2279	5322 121 42386	100nF 5% 63V
2280	4822 124 11878	4700µF 16V
2282	4822 124 41579	10µF 20% 50V
2289	4822 124 40242	1µF 20% 63V
2290	4822 124 81029	100µF 20% 25V
2291	4822 124 81151	22µF 50V
2292	4822 122 33195	100pF 10% 50V
2300	4822 121 51387	10nF 20% 16V
2301	4822 124 41584	100µF 20% 10V
2303	4822 121 41857	10nF 5% 250V
2321	4822 122 33847	10pF 5% 50V
2322	4822 122 33847	10pF 5% 50V
2323	4822 124 41576	2,2µF 20% 50V
2324	4822 124 41576	2,2µF 20% 50V
2325	4822 122 33532	3,3nF 5% 50V
2326	4822 122 33532	3,3nF 5% 50V
2327	5322 122 32334	220pF 10% 100V
2328	5322 122 32334	220pF 10% 100V
2329	5322 122 32311	470pF 10% 100V
2330	5322 122 32311	470pF 10% 100V
2331	5322 122 32261	4,7nF 10% 100V
2333	4822 124 81151	22µF 50V
2334	4822 124 81151	22µF 50V
2335	4822 122 33847	10pF 5% 50V
2336	4822 122 33847	10pF 5% 50V
2341	4822 126 11585	22nF +80/-20% 25V
2342	4822 126 11585	22nF +80/-20% 25V
2343	4822 124 41579	10µF 20% 50V
2344	4822 124 80068	22µF 20% 100V
2345	4822 124 80068	22µF 20% 100V
2346	4822 124 41579	10µF 20% 50V
2347	4822 124 41579	10µF 20% 50V
2348	4822 124 81043	10µF 20% 100V
2349	4822 124 81043	10µF 20% 100V
2350	5322 121 42386	100nF 5% 63V
2351	5322 121 42386	100nF 5% 63V
2352	4822 124 80556	1000µF 20% 10V
2353	5322 121 42386	100nF 5% 63V
2354	5322 121 42386	100nF 5% 63V
2355	5322 122 32261	4,7nF 10% 100V
2356	5322 122 32261	4,7nF 10% 100V
2365	4822 126 11585	22nF +80/-20% 25V

RESISTORS

3251	4822 116 52256		2k2 5% 0,5W
3252	4822 116 52256		2k2 5% 0,5W
3254	4822 116 52228		680R 5% 0,5W
3255	4822 116 83883		470R 5% 0,5W
3259	4822 116 83864		10k 5% 0,5W
3260	4822 117 11342		0R33 5% 2W
3261	4822 116 83876		270R 5% 0,5W
3262	4822 116 52206		120R 5% 0,5W
3264	4822 116 83864		10k 5% 0,5W
3265	4822 116 52234		100k 5% 0,5W
3266	4822 116 52228		680R 5% 0,5W
3267	4822 116 52276		3k9 5% 0,5W
3268	4822 116 83864		10k 5% 0,5W
3269	4822 116 83864		10k 5% 0,5W
3270	4822 117 11342		0R33 5% 2W
3271	4822 116 52234		100k 5% 0,5W
3273	4822 116 52283		4k7 5% 0,5W
3275	4822 116 52283		4k7 5% 0,5W
3276	4822 116 83961		6k8 5%
3277	4822 116 52283		4k7 5% 0,5W
3280	4822 116 52239		120k 5% 0,5W
3281	4822 116 83864		10k 5% 0,5W
3282	4822 052 10479	⚠	47R 5% 0,33W
3285	4822 116 52269		3k3 5% 0,5W
3286	4822 116 52269		3k3 5% 0,5W
3287	4822 116 52257		22k 5% 0,5W
3288	4822 052 10479	⚠	47R 5% 0,33W
3289	4822 052 10479	⚠	47R 5% 0,33W
3291	4822 116 52263		2k7 5% 0,5W
3292	4822 116 83872		220R 5% 0,5W
3293	4822 116 52207		1k2 5% 0,5W
3294	4822 116 52243		1k5 5% 0,5W
3295	4822 116 83864		10k 5% 0,5W

ELECTRICAL PARTS LIST - PS & L/R AMP. BOARD

RESISTORS

3296	4822 116 52283		4k7 5% 0,5W
3297	4822 116 52256		2k2 5% 0,5W
3298	4822 116 52219		330R 5% 0,5W
3299	4822 116 52219		330R 5% 0,5W
3300	4822 052 10478	⚠	4R7 5% 0,33W
3302	4822 116 83884		47k 5% 0,5W
3304	4822 116 83884		47k 5% 0,5W
3305	4822 116 52257		22k 5% 0,5W
3306	4822 116 52257		22k 5% 0,5W
3307	4822 116 52256		2k2 5% 0,5W
3312	4822 116 83864		10k 5% 0,5W
3313	4822 050 11002		1k 1% 0,4W
3315	4822 116 83884		47k 5% 0,5W
3316	4822 116 83884		47k 5% 0,5W
3321	4822 116 83864		10k 5% 0,5W
3322	4822 116 83864		10k 5% 0,5W
3323	4822 116 52234		100k 5% 0,5W
3324	4822 116 83864		10k 5% 0,5W
3325	4822 050 11002		1k 1% 0,4W
3326	4822 050 11002		1k 1% 0,4W
3327	4822 116 52291		56k 5% 0,5W
3328	4822 116 52291		56k 5% 0,5W
3329	4822 116 52226		560R 5% 0,5W
3330	4822 116 52226		560R 5% 0,5W
3331	4822 116 52291		56k 5% 0,5W
3332	4822 116 52291		56k 5% 0,5W
3333	4822 052 10479	⚠	47R 5% 0,33W
3334	4822 052 10479	⚠	47R 5% 0,33W
3335	4822 116 52207		1k2 5% 0,5W
3336	4822 116 52207		1k2 5% 0,5W
3337	4822 050 11002		1k 1% 0,4W
3338	4822 050 11002		1k 1% 0,4W
3339	4822 113 80633	⚠	0R1 5% 3W
3340	4822 113 80633	⚠	0R1 5% 3W
3345	4822 116 52234		100k 5% 0,5W
3346	4822 116 83864		10k 5% 0,5W
3347	4822 116 52271		33k 5% 0,5W
3348	4822 116 83872		220R 5% 0,5W
3350	4822 050 11002		1k 1% 0,4W
3351	4822 116 52234		100k 5% 0,5W
3352	4822 116 52234		100k 5% 0,5W
3353	4822 116 52257		22k 5% 0,5W
3355	4822 116 83961		6k8 5%
3356	4822 116 83961		6k8 5%
3357	4822 116 52234		100k 5% 0,5W
3358	4822 050 11002		1k 1% 0,4W
3363	4822 053 10478	⚠	4R7 5% 1W
3364	4822 053 10478	⚠	4R7 5% 1W
3365	4822 116 52234		100k 5% 0,5W
3366	4822 116 52234		100k 5% 0,5W
3367	4822 116 52304		82k 5% 0,5W
3368	4822 116 52304		82k 5% 0,5W
3369	4822 116 83884		47k 5% 0,5W
3370	4822 116 83884		47k 5% 0,5W
3383	4822 116 83864		10k 5% 0,5W
3384	4822 116 83864		10k 5% 0,5W
3385	4822 052 10108	⚠	1R 5% 0,33W

COILS

5321	4822 157 70599	Ind. Fxd Bead EMI 1μH
5322	4822 157 70599	Ind. Fxd Bead EMI 1μH

DIODES

6251	4822 130 83302		GBU4D
6252	5322 130 80686		1N5392
6253	4822 130 34382		BZX79-C8V2
6255	4822 130 11139	⚠	GBU8D
6260	5322 130 80686		1N5392
6261	5322 130 80686		1N5392
6262	5322 130 80686		1N5392
6263	5322 130 80686		1N5392
6264	4822 130 61219		BZX79-F10
6281	4822 130 31878		1N4003GP
6284	4822 130 34173		BZX79-C5V6
6289	4822 130 34328		BZX79-C30
6292	4822 130 30621		1N4148
6293	4822 130 34382		BZX79-C8V2
6294	5322 130 80686		1N5392
6295	4822 130 30621		1N4148
6298	4822 130 34278		BZX79-C6V8
6299	4822 130 30621		1N4148
6300	4822 130 30621		1N4148
6301	4822 130 30621		1N4148
6302	5322 130 31504		BZX79-C3V3
6325	4822 130 34278		BZX79-C6V8
6326	4822 130 34278		BZX79-C6V8
6333	4822 130 34281		BZX79-C15
6334	4822 130 34281		BZX79-C15
6337	4822 130 30621		1N4148
6339	4822 130 30621		1N4148
6360	4822 130 34281		BZX79-C15

TRANSISTORS & INTEGRATED CIRCUITS

7251	4822 130 10812	BDX53BFI
7252	4822 130 40959	BC547B
7253	4822 130 44568	BC557B
7255	4822 130 40959	BC547B
7260	4822 130 40959	BC547B
7263	4822 130 40959	BC547B
7265	4822 130 41691	BC556B
7266	4822 130 44568	BC557B
7268	4822 130 40959	BC547B
7280	4822 130 40959	BC547B
7281	4822 209 31841	L7805CP
7282	4822 130 41246	BC327-25
7286	4822 130 41246	BC327-25
7290	4822 130 41246	BC327-25
7291	4822 130 40959	BC547B
7293	4822 130 40959	BC547B
7294	4822 130 44568	BC557B
7297	4822 130 40959	BC547B
7323	4822 130 44461	BC546B
7324	4822 130 44461	BC546B
7325	4822 130 40959	BC547B
7326	4822 130 40959	BC547B
7327	4822 130 44461	BC546B
7329	4822 209 16165	STk417-120A
7350	4822 130 41691	BC556B

ELECTRICAL PARTS LIST - PS & L/R AMP. BOARD

Note: Only the parts mentioned in this list are normal service spare parts.

AF5 BOARD

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BRIEF INTRODUCTION OF THE AF5 BOARD

The AF5 Board consists of the following features :

a. SOFAC IC
SOFAC IC TEA6321 (7553) includes functions such as source selection, loudness control, dynamic bass control, treble control, front/rear volume control and muting function. Sound features such as DBB, DSC and IS are controllable via I²C data from the microprocessor.

The SOFAC IC caters for 4 input sources, namely tuner, tape, CD and AUX. It also has a MONO input which is tied to ground via 100n. In our application , software will switch the input source to MONO input during STANDBY and other occasions where noise from other input sources is undesirable.

Note: Input to SOFAC IC must be ac-coupled to prevent 'plop' noise.

b. KARAOKE MIC. MIXING
Karaoke Mic. Mixing can be configured to cater for one of the following :.
NK : Non Karaoke.
SK : Simple Karaoke which caters for mic. mixing with additional mic. amplifier board.
FK : Full Karaoke with vocal fader and echo effect with additional karaoke board.

c. DOLBY PRO LOGIC (DPL) INTERFACE
DPL Interface can be configured to cater for DPL and also DPL with one of the karaoke functions.

d. LINE OUT
Line Out with JST XH connector for connection to LINE OUT cinch socket.

e. SUB-WOOFER OUTPUT
Sub-Woofer Output with cinch socket for connection to active sub-woofer speaker.

f. INCREDIBLE SURROUND
Incredible Surround effect using transistor circuit BC847C (7517, 7518, 7519, 7520) to create phase shifting and spatial effect.

g. HEADPHONE AMPLIFIER
Headphone Amplifier using Op-Amp. NJM4556AM (7501).

h. CD STANDBY SWITCH
CD Standby control circuit using transistors BC327-25 (7515) and BC847C (7516) which switches on the supply to CD servo control IC , HF circuit and the laser light pen in CD mode only.

i. HEADPHONE SENSING CIRCUIT
Headphone Sensing circuit to mute centre and surround channels in DPL application.

j. ATTENUATION NETWORK
Attenuation network is provided at the output of the AF5 Board for interfacing with the power board of different output power.

AF5

AF5
A87
A87
A87
A87
A87

Varia

Item
30
31
54
150
151
151
151
152
152
153
157
2541
261
2644
264
265
265
2671
267
267
350
351
3577
3597
360
361
364
3674
367
3701
4501
4574
465
4652
9507
962

x = Ite

BRIEF INTRODUCTION OF THE AF5 BOARD

The AF5 Board consists of the following features :

a. SOFAC IC

SOFAC IC TEA6321 (7553) includes functions such as source selection, loudness control, dynamic bass control, treble control, front/rear volume control and muting function. Sound features such as DBB, DSC and IS are controllable via I^{2}C data from the microprocessor.

The SOFAC IC caters for 4 input sources, namely tuner, tape, CD and AUX. It also has a MONO input which is tied to ground via 100n. In our application, software will switch the input source to MONO input during STANDBY and other occasions where noise from other input sources is undesirable.

Note: Input to SOFAC IC must be ac-coupled to prevent 'plop' noise.

b. KARAOKE MIC. MIXING

Karaoke Mic. Mixing can be configured to cater for one of the following :.

NK : Non Karaoke.
SK : Simple Karaoke which caters for mic. mixing with additional mic. amplifier board.
FK : Full Karaoke with vocal fader and echo effect with additional karaoke board.

c. DOLBY PRO LOGIC (DPL) INTERFACE

DPL Interface can be configured to cater for DPL and also DPL with one of the karaoke functions.

d. LINE OUT

Line Out with JST XH connector for connection to LINE OUT cinch socket.

e. SUB-WOOFER OUTPUT

Sub-Woofer Output with cinch socket for connection to active sub-woofer speaker.

f. INCREDIBLE SURROUND

Incredible Surround effect using transistor circuit BC847C (7517, 7518, 7519, 7520) to create phase shifting and spatial effect.

g. HEADPHONE AMPLIFIER

Headphone Amplifier using Op-Amp. NJM4556AM (7501).

h. CD STANDBY SWITCH

CD Standby control circuit using transistors BC327-25 (7515) and BC847C (7516) which switches on the supply to CD servo control IC , HF circuit and the laser light pen in CD mode only.

i. HEADPHONE SENSING CIRCUIT

Headphone Sensing circuit to mute centre and surround channels in DPL application.

j. ATTENUATION NETWORK

Attenuation network is provided at the output of the AF5 Board for interfacing with the power board of different output power.

AF5 board application

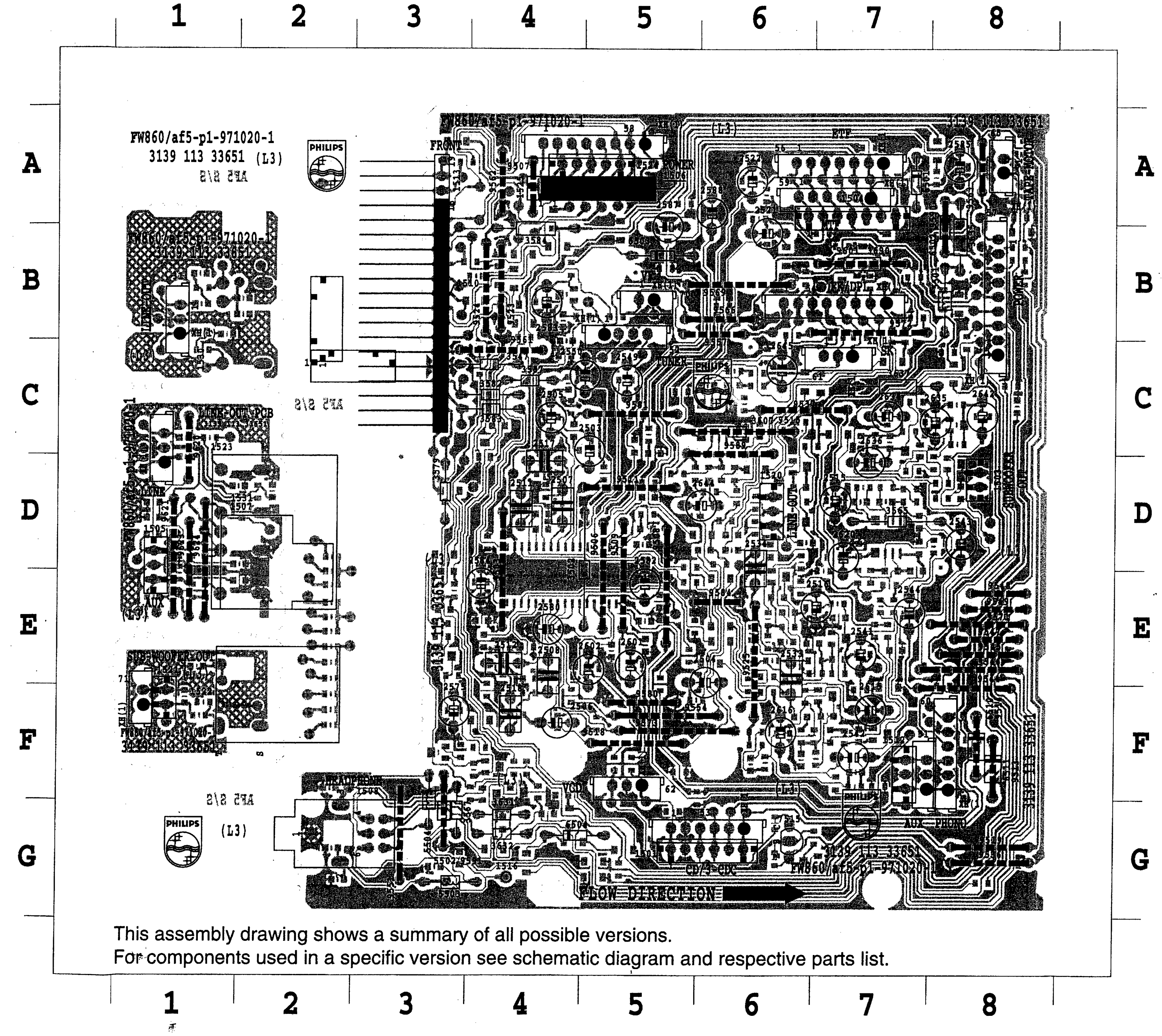
AF5 pcb	Used by:
A87760	FW850C/21/21M, FW855C/21/21M/33
A87780	FW850C/22/34, FW855C/34
A87820	FW860P/21/21M
A87890	FW880P/22/34, FW880W/22/34
A87910	FW880P/21/21M/33, FW880W/21/21M

Variations table for different AF5 boards

Item Nos.	A87760	A87780	A87820	A87890	A87910
30	-	-	x	-	-
31	x	x	-	x	x
54	x	-	x	x	x
1506	-	-	x	-	-
1510	-	-	x	-	-
1513	x	x	-	x	x
1518	-	-	x	x	x
1523	-	-	x	-	-
1525	x	x	-	x	x
1530, 1531	x	x	-	x	x
1576	x	-	-	-	-
2541, 2542	47u	0u47	47u	47u	47u
2615, 2616	4u7	4u7	10u	10u	10u
2644, 2645	0u47	0u47	4u7	4u7	4u7
2648, 2649	-	-	1u	-	-
2650, 2651	-	-	2n2	-	-
2652, 2653	-	-	22n	-	-
2671, 2672	1u	1u	-	1u	1u
2673, 2674	2n2	2n2	-	2n2	2n2
2675, 2676	22n	22n	-	22n	22n
3503, 3504	5k6	5k6	3k9	5k6	5k6
3519, 3520	8k2	-	6k8	6k8	6k8
3577, 3578	4k7	4k7	3k3	4k7	4k7
3597, 3598	-	-	27k	27k	27k
3605, 3606	2k2	2k2	2k2	1k2	2k2
3618, 3619	-	-	1k	-	-
3645, 3646	1k8	-	1k8	1k8	1k8
3674	2k2	2k2	3k3	4k7	4k7
3675	2k2	3k3	2k2	3k3	2k2
3701, 3702	1k	1k	-	1k	1k
4501, 4502	-	x	-	-	-
4574	x	x	-	x	x
4650, 4651	-	-	x	-	x
4652	-	-	x	-	-
9507	-	-	x	-	-
9623, 9624	x	x	-	x	x

x = Item in use

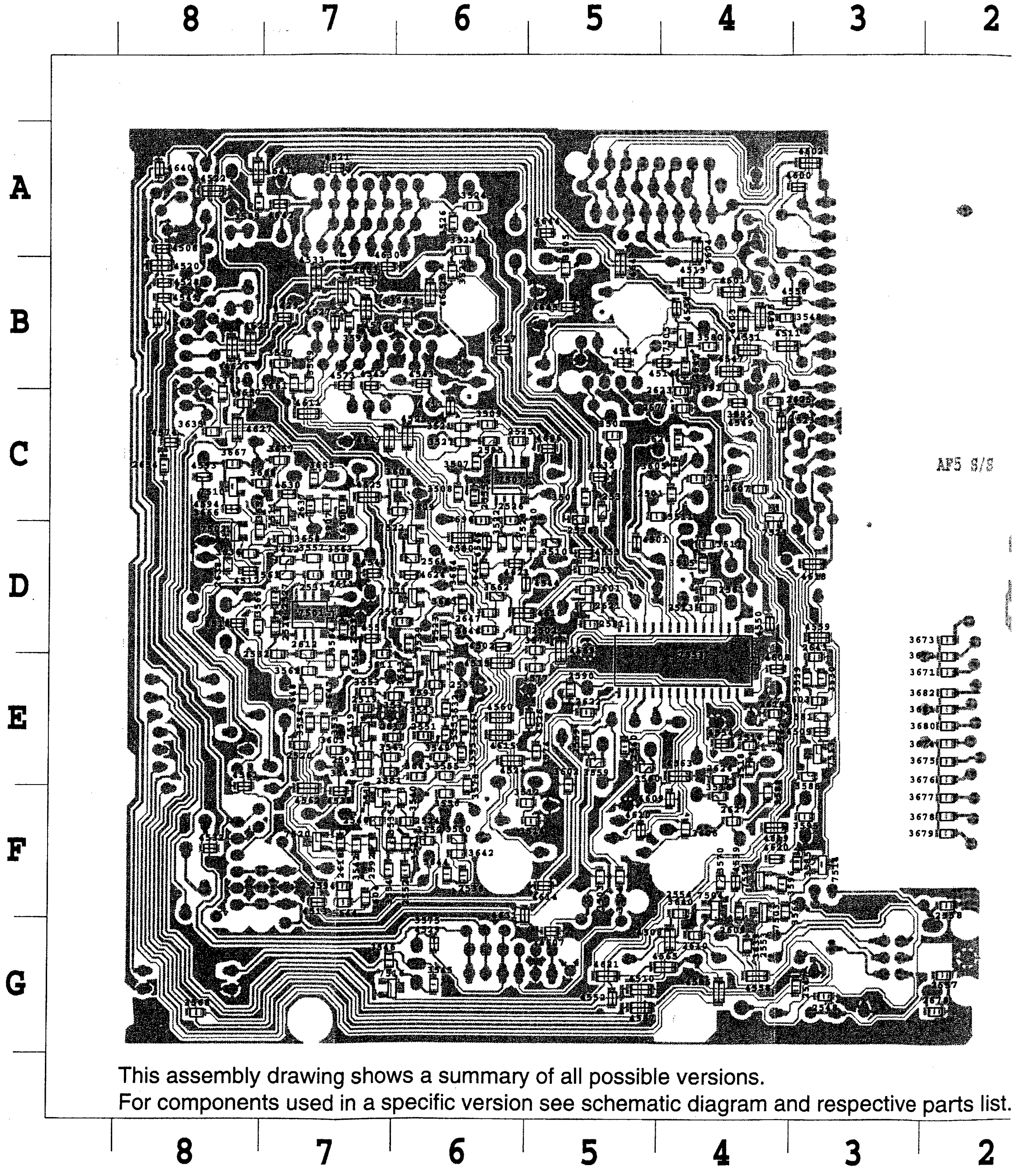
COMPONENT LAYOUT



This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram and respective parts list.

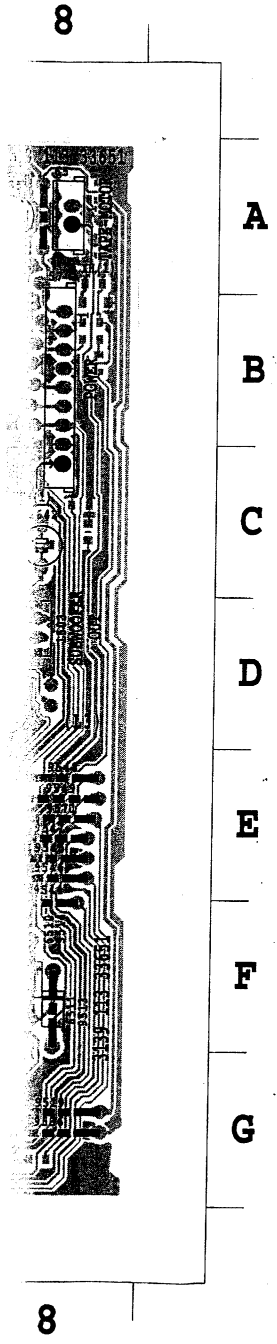
30	C	1
31	B	1
51	F	7
52	B	5
53	G	6
54	B	7
56	A	7
57	B	8
58	A	5
59	A	7
60	F	8
61	C	7
62	F	5
65	A	8
70	B	5
71	F	1
1501	G	6
1503	D	8
1504	A	7
1505	D	1
1506	A	5
1507	E	2
1508	G	2
1510	B	3
1512	F	7
1513	B	3
1516	G	4
1520	D	6
1521	F	1
1522	F	2
1523	D	2
1524	A	5
1525	A	5
1530	B	2
1531	C	2
2503	C	5
2504	E	6
2505	C	4
2506	F	4
2507	D	4
2508	E	4
2511	D	4
2512	E	4
2515	D	7
2516	E	7
2517	D	4
2518	F	4
2521	B	6
2522	A	6
2533	E	6
2534	D	6
2541	E	7
2542	F	7
2543	D	8
2544	E	7
2549	C	5
2550	C	5
2575	F	3
2580	E	4
2582	E	5
2583	B	4
2584	E	4
2585	A	8
2587	B	5
2588	A	6
2601	E	5
2602	E	5
2615	F	7
2616	F	6
2620	D	7
2634	C	7
2635	C	8
2636	D	7
2642	C	8
2644	D	6
2645	C	6
3502	E	5
3547	C	4
3565	D	7
3567	G	3
3579	D	3
3582	C	4
3583	C	4
3584	B	4
3587	C	4
3607	C	6
3631	G	4
3632	G	4
3635	B	8
3637	C	7
3690	B	7
5501	B	8
5502	G	3
5503	G	3
5504	G	3
6501	A	7
6502	B	8
6503	B	5
6504	G	4
6510	F	8
6511	F	8
7515	G	6
9503	E	4
9506	E	5
9507	A	4
9508	E	5
9509	E	5
9511	D	5
9513	F	8
9514	F	8
9515	C	6
9518	F	5
9519	G	8
9523	B	4
9524	B	4
9525	E	6
9536	G	8
9537	C	6
9544	F	8
9545	E	8
9546	E	8
9547	E	8
9548	E	8
9549	E	8
9551	G	3
9554	F	5
9557	B	6
9561	C	4
9562	A	4
9563	A	8
9566	B	6
9569	B	6
9571	E	8
9572	B	7
9573	F	5
9580	F	5
9581	C	5
9584	E	6
9589	C	6
9590	B	8
9591	G	3
9601	B	7
9620	C	1
9621	D	1
9623	E	1
9624	D	1

CHIP LAYOUT

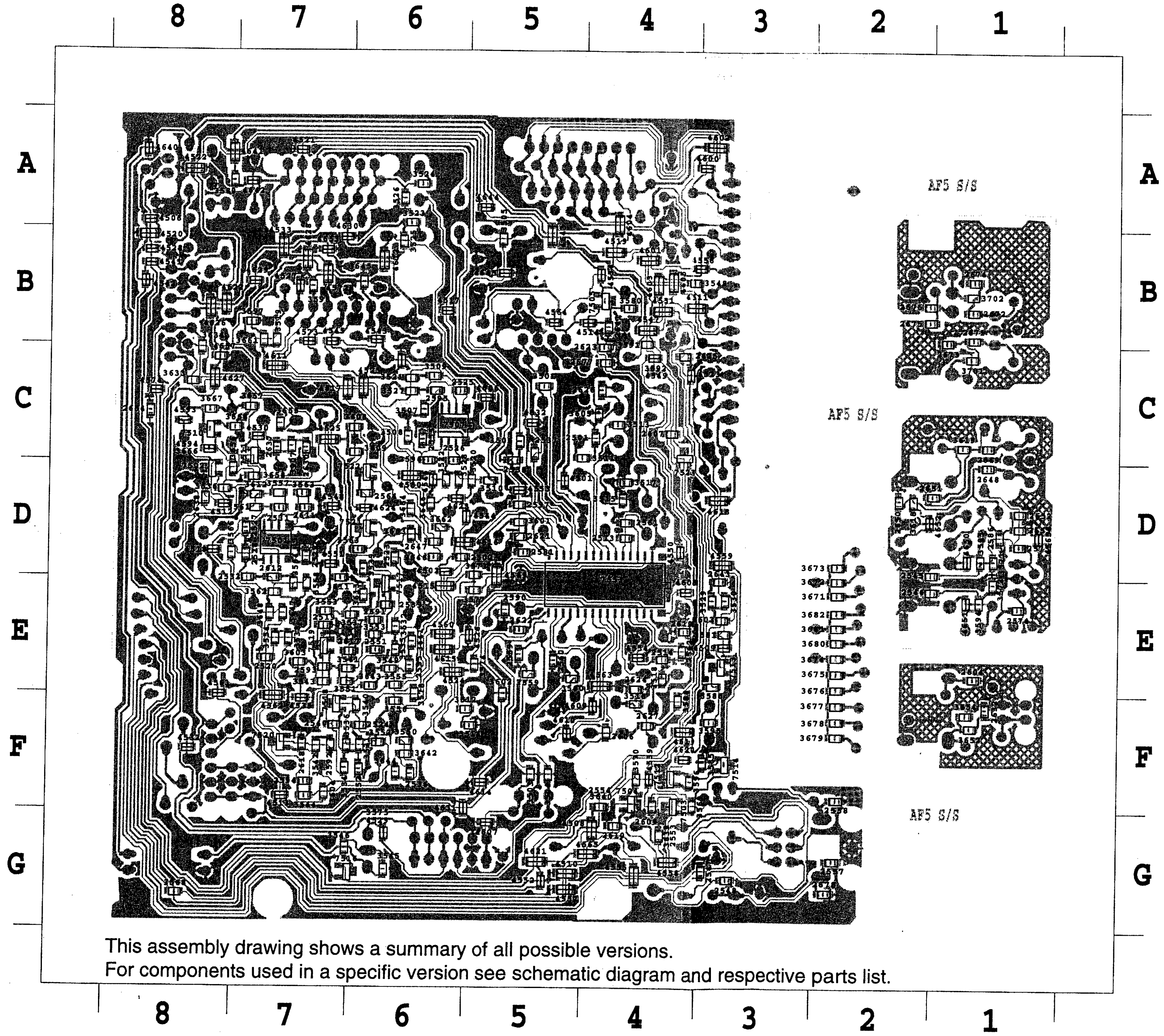


This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram and respective parts list.

CHIP LAYOUT



30	C	1	2580	E	4	9536	C	8
31	B	1	2582	E	5	9537	C	6
51	F	7	2583	B	4	9544	F	8
52	B	5	2584	E	4	9545	E	8
53	G	6	2585	A	8	9546	E	8
54	B	7	2587	B	5	9547	E	8
56	A	7	2588	A	6	9548	E	8
57	B	8	2601	E	5	9549	E	8
58	A	5	2602	E	5	9551	G	3
59	A	7	2615	F	7	9554	F	5
60	F	8	2616	F	6	9557	B	6
61	C	7	2620	D	7	9561	C	4
62	F	5	2634	C	7	9562	A	4
65	A	8	2635	C	8	9563	A	8
70	B	5	2636	D	7	9566	B	6
71	F	1	2642	C	8	9569	B	6
1501	G	6	2644	D	6	9571	E	8
1503	D	8	2645	C	6	9572	B	7
1504	A	7	3502	E	5	9573	F	5
1505	D	1	3547	C	4	9580	F	5
1506	A	5	3565	D	7	9581	C	5
1507	E	2	3567	G	3	9584	E	6
1508	G	2	3579	D	3	9589	C	6
1510	B	3	3582	C	4	9590	B	8
1512	F	7	3583	C	4	9591	G	3
1513	B	3	3584	B	4	9601	B	7
1516	G	4	3587	C	4	9620	C	1
1520	D	6	3607	C	6	9621	D	1
1521	F	1	3631	G	4	9623	E	1
1522	F	2	3632	G	4	9624	D	1
1523	D	2	3635	B	8			
1524	A	5	3637	C	7			
1525	A	5	3690	B	7			
1530	B	2	5501	B	8			
1531	C	2	5502	G	3			
2503	C	5	5503	G	3			
2504	E	6	5504	G	3			
2505	C	4	6501	A	7			
2506	F	4	6502	B	8			
2507	D	4	6503	B	5			
2508	E	4	6504	G	4			
2511	D	4	6510	F	8			
2512	E	4	6511	F	8			
2515	D	7	7515	G	6			
2516	E	7	9503	E	4			
2517	D	4	9506	E	5			
2518	F	4	9507	A	4			
2521	B	6	9508	E	5			
2522	A	6	9509	E	5			
2533	E	6	9511	D	5			
2534	D	6	9513	F	8			
2541	E	7	9514	F	8			
2542	F	7	9515	C	6			
2543	D	8	9518	F	5			
2544	E	7	9519	G	8			
2549	C	5	9523	B	4			
2550	C	5	9524	B	4			
2575	F	3	9525	E	6			



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For components used in a specific version see schematic diagram and respective parts list.

2501	C	4	2618	F	7	3528	D	6	3596	F	4	4502	D	6	4574	C	8	7514	F	3
2502	D	6	2619	E	4	3529	E	3	3597	B	7	4506	A	8	4580	D	6	7516	G	7
2513	D	4	2621	D	5	3530	E	3	3598	B	7	4508	G	4	4593	C	8	7517	E	6
2514	E	4	2622	E	5	3531	F	6	3601	D	5	4509	E	3	4594	C	8	7518	F	7
2519	E	7	2623	C	4	3532	E	6	3602	E	5	4510	G	5	4600	A	3	7519	E	7
2520	E	7	2624	E	4	3533	E	6	3603	E	7	4511	B	4	4601	B	4	7520	F	7
2523	D	6	2625	C	4	3534	F	7	3604	F	7	4512	D	8	4602	A	3	7521	D	6
2524	F	6	2626	C	4	3535	E	6	3605	C	4	4513	F	7	4603	B	4	7522	D	6
2525	C	6	2627	F	4	3536	F	7	3606	F	4	4514	B	4	4604	A	4	7523	C	4
2526	C	6	2630	C	7	3537	E	6	3608	C	6	4515	E	6	4605	B	4	7553	E	4
2527	D	7	2632	F	1	3538	E	7	3609	C	6	4517	B	6	4606	C	5	45658	D	1
2528	D	7	2637	C	7	3539	D	6	3611	E	7	4518	D	8	4607	G	5			
2529	D	7	2638	D	8	3540	F	6	3612	D	7	4519	B	4	4608	E	4			
2531	D	7	2641	B	4	3541	E	7	3613	E	6	4520	B	8	4609	F	4			
2532	E	7	2643	E	3	3542	F	7	3618	D	2	4521	A	7	4610	F	5			
2535	E	6	2646	D	6	3543	E	7	3619	C	1	4522	A	8	4611	C	7			
2536	F	6	2647	D	6	3544	F	7	3633	C	8	4523	C	4	4612	B	6			
2537	C	5	2648	D	1	3545	G	6	3634	C	8	4524	E	6	4613	C	6			
2538	C	5	2649	C	1	3546	G	7	3636	D	8	4525	C	6	4614	F	5			
2539	E	6	2650	D	2	3548	B	4	3639	G	4	4526	E	5	4615	E	6			
2540	F	7	2651	D	2	3549	E	6	3640	F	4	4527	B	7	4616	D	6			
2545	D	2	2652	D	1	3550	F	6	3641	E	6	4528	B	8	4617	C	7			
2546	E	2	2653	D	1	3551	E	7	3642	F	6	4529	G	6	4618	D	3			
2547	G	3	2654	C	8	3552	F	6	3643	E	6	4530	C	7	4619	F	4			
2548	G	3	2671	B	1	3553	E	7	3644	F	6	4531	B	4	4620	F	4			
2551	E	6	2672	B	1	3554	E	7	3645	B	6	4532	F	8	4621	G	5			
2552	F	6	2673	B	1	3555	E	6	3646	D	6	4533	B	7	4622	B	8			
2553	G	4	2674	B	1	3556	F	6	3647	E	7	4534	B	4	4623	D	6			
2554	F	4	2675	B	2	3557	D	7	3648	E	7	4535	F	7	4624	D	6			
2555	C	6	2676	B	2	3558	E	7	3652	F	1	4539	F	4	4625	C	7			
2557	G	2	2677	C	4	3559	E	5	3654	F	1	4541	B	8	4626	B	8			
2558	F	2	2678	G	2	3560	E	5	3655	C	7	4542	B	8	4627	C	8			
2559	E	5	3501	C	5	3561	D	7	3656	D	8	4543	B	6	4628	B	7			
2560	E	5	3503	F	5	3562	E	7	3657	C	7	4544	D	6	4629	B	7			
2561	D	4	3504	F	5	3563	D	7	3658	D	7	4545	B	7	4630	B	7			
2562	E	4	3505	B	5	3564	E	7	3661	B	7	4546	D	6	4631	F	6			
2563	D	6	3506	C	5	3566	D	8	3662	D	6	4547	B	4	4632	C	5			
2564	D	6	3507	C	6	3568	G	8	3663	D	6	4548	D	7	4640	A	8			
2573	D	1	3508	C	6	3569	F	4	3664	D	6	4549	C	4	4641	A	8			
2574	E	1	3509	C	6	3570	F	4	3666	C	8	4550	D	4	4642	A	7			
2581	D	5	3510	D	5	3571	D	1	3667	C	8	4551	D	7	4643	B	5			
2586	D	1	3511	C	5	3572	E	1	3668	C	8	4552	G	5	4644	A	5			
2590	E	5	3512	F	5	3573	D	5	3671	E	2	4553	D	5	4645	B	5			
2591	E	6	3513	C	4	3574	E	5	3672	E	2	4554	E	4	4650	D	1			
2592	F	7	3514	F	5	3575	G	6	3673	D	2	4555	G	4	4651	E	1			
2593	E	7	3515	D	4	3577	E	5	3674	E	2	4556	B	4	4652	D	2			
2594	F	7	3516	F	4	3578	F	6	3675	E	2	4557	G	5	4653	B	7			
2595	C	6	3517	D	4	3580	B	4	3676	E	2	4558	G	4	4657	C	8			
2596	C	6	3518	E	4	3581	E	3	3677	F	2	4559	D	3	7501	D	7			
2597	D	5	3519	B	7	3585	F	3	3678	F	2	4560	E	6	7502	D	8			
2603	E	3	3520	D	5	3586	E	3	3679	F	2	4561	F	8	7503	F	4			
2604	E	1	3521	C	6	3588	F	4	3680	E	2	4562	F	7	7504	F	4			
2607	C	4	3522	D	6	3589	A	8	3681	E	2	4563	E	4	7505	B	4			
2609	F	4	3523	A	6	3591	B	4	3682	E	2	4564	B	5	7507	C	6			
2610	G	4	3524	A	6	3592	C	4	3701	C	1	4565	G	4	7510	C	8			
2611	D	7	3525	B	6	3593	D	1	3702	B	1	4569	D	5	7511	C	7			
2612	E	7	3526	A	6	3594	E	1	3907	C	7	4572	B	7	7512	F	4			
2617	E	7	3527	C	6	3595	F	3	4501	D	5	4573	B	7	7513	E	3			

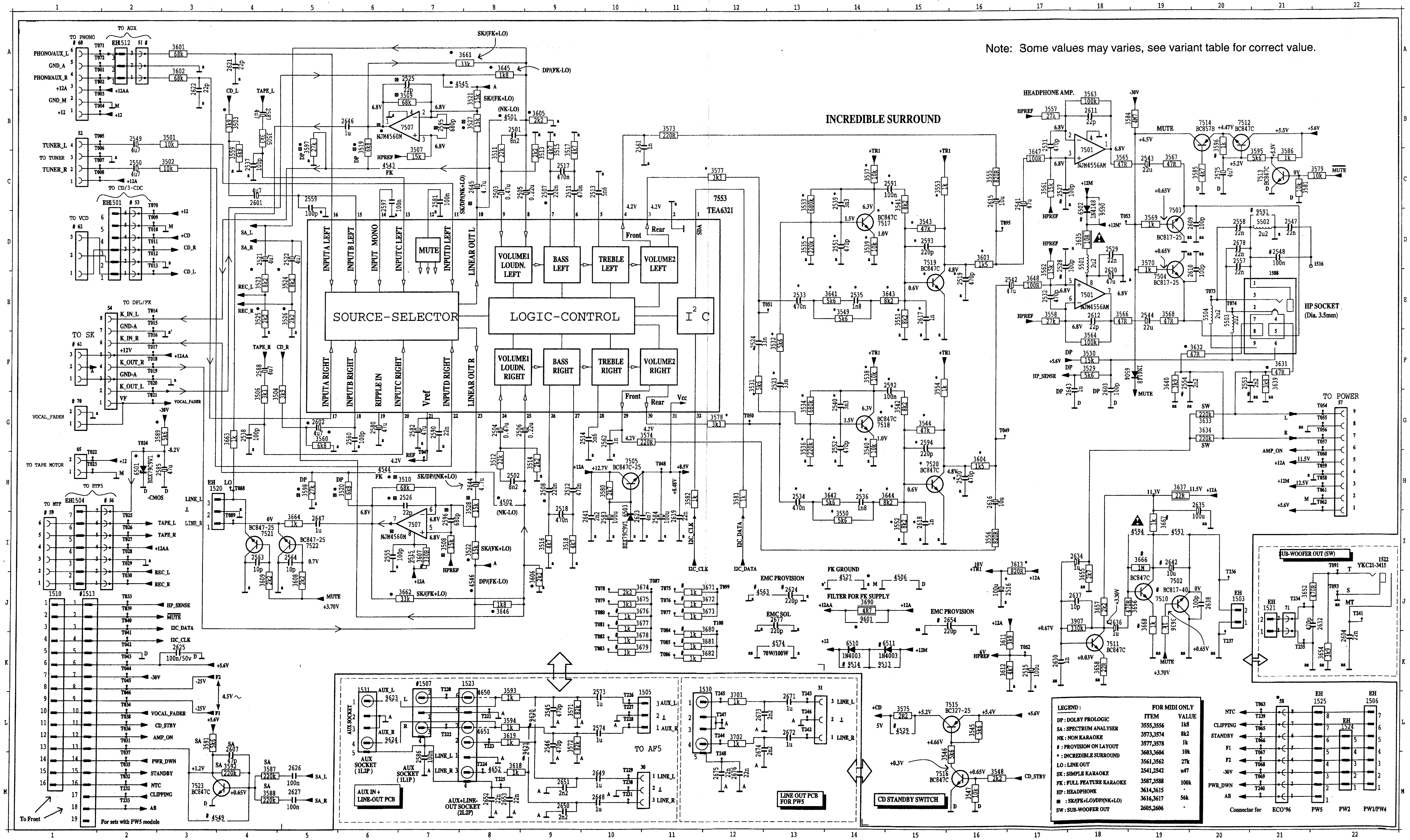
CIRCUIT DIAGRAM

1501	C 2	1521	J21	2506	G 8	2520	H16	2533	E13	2545	L 9	2558	D20	2582	G 7
1503	J20	1522	I22	2507	C 9	2521	D 4	2534	H13	2546	L 9	2559	C 5	2583	I10
1504	H 1	1523	K 8	2508	H 9	2522	D 5	2535	E14	2547	D21	2560	G 6	2584	I11
1505	K11	1524	L22	2511	C 9	2523	F13	2536	H14	2548	D21	2561	B10	2585	H 3
1506	L22	1525	L22	2512	H 9	2524	F12	2537	C 4	2549	B 2	2562	G10	2586	M 7
1507	K 7	1530	K11	2513	C10	2525	A 7	2538	G 4	2550	C 2	2563	I 4	2587	B 4
1508	E21	1531	K 6	2514	G10	2526	H 7	2539	C14	2551	D14	2564	I 5	2588	F 4
1510	J 1	2501	B 8	2515	K17	2527	C17	2540	G14	2552	G14	2573	K10	2590	G 7
1512	A 2	2502	H 8	2516	J16	2528	D17	2541	C17	2553	F20	2574	L10	2591	C15
1513	J 1	2503	C 8	2517	C 9	2529	D18	2542	E17	2554	F19	2575	C20	2592	F15
1516	D22	2504	G 8	2518	H 9	2531	B17	2543	C19	2555	I 6	2580	G 6	2593	D15
1520	H 4	2505	C 8	2519	E16	2532	E17	2544	E19	2557	D20	2581	C 7	2594	G15

2595	B 7	2615	C16	2627	M 5	2645	C 8	2673	L12	3505	B 4	3517	B 9	3529	F18
2596	I 7	2616	H16	2630	K17	2646	B 6	2674	L12	3506	G 4	3518	I 9	3530	F18
2597	C 6	2617	E15	2632	J22	2647	I 5	2675	M12	3507	C 7	3519	B 6	3531	F12
2601	C 4	2618	I15	2634	I18	2648	M10	2676	M12	3508	I 7	3520	H 6	3532	F13
2602	G 5	2619	I11	2635	H20	2649	M10	2677	J13	3509	B 7	3521	B 8	3533	C13
2603	F18	2620	E18	2636	J18	2650	M 9	2678	D20	3510	H 7	3522	I 8	3534	G13
2604	K22	2621	A 4	2637	J18	2651	M 9	30	M10	3511	C 8	3523	E 4	3535	D13
2607	L 4	2622	A 3	2638	J20	2652	M 8	31	K13	3512	H 8	3524	E 5	3536	G13
2609	D20	2623	I10	2641	I10	2653	M 8	3501	B 3	3513	C 9	3525	E 4	3537	C14
2610	E20	2624	J13	2642	I19	2654	J16	3502	C 3	3514	H 9	3526	E 5	3538	F14
2611	B18	2625	K 3	2643	F18	2671	L13	3503	B 4	3515	B 9	3527	B 8	3539	D14
2612	E18	2626	M 5	2644	H 8	2672	L13	3504	G 4	3516	I 9	3528	H 8	3540	G14

3541	C15	3553	C15	3566	E18	3579	C22	3592	M 4	3606	J 9	3634	G20	3647	C17
3542	G15	3554	F15	3567	C19	3580	H10	3593	L 8	3607	I 7	3635	D18	3648	E17
3543	D15	3555	C16	3568	E19	3581	C21	3594	L 8	3608	J 5	3636	J19	3652	J21
3544	G15	3556	I16	3569	D19	3582	H11	3595	C21	3609	J 4	3637	H19	3654	K22
3545	L16	3557	B17	3570	D19	3583	H12	3596	B20	3611	K16	3639	F21	3655	J18
3546	M15	3558	E17	3571	L 9	3584	B18	3597	B 5	3612	K16	3640	F19	3656	J19
3547	M16	3559	C 4	3572	L 9	3585	C20	3598	H 5	3613	I17	3641	E14	3657	J18
3548	M16	3560	G 5	3573	B11	3586	C21	3601	A 3	3618	M 8	3642	H14	3658	K18
3549	E14	3561	C17	3574	G11	3587	M 4	3602	A 3	3619	L 8	3643	E15	3661	A 8
3550	I14	3563	B18	3575	L15	3588	M 4	3603	D16	3631	F21	3644	H15	3662	J 7
3551	E15	3564	F18	3577	C12	3589	G 2	3604	H16	3632	F20	3645	A 8	3663	G 4
3552	I15	3565	C18	3578	G12	3591	L 3	3605	B 9	3633	G20	3646	J 8	3664	I 5

3666	I19	3680	J12	4543	C 6	51	A 2	60	A 1	7501	B18	7514	B20	9514	K14
3667	I19	3681	K12	4544	H 6	52	B 1	61	F 1	7501	E18	7515	L15	9515	I 7
3668	J19	3682	K12	4545	A 7	53	C 2	62	D 1	7502	J19	7516	M15	9590	C18
3671	J12	3690	J14	4546	J 8	54	E 2	65	G 1	7503	D19	7517	D15	9591	D21
3672	J12	3701	L12	4549	M 4	5501	D18	6501	H 2	7504	E19	7518	G15	9601	J14
3673	J12	3702	L12	4563	J12	5502	D21	6502	C18	7505	H10	7519	D15	9620	L 9
3674	J10	3907	J18	4574	K13	5503	E20	6503	H10	7507	B 6	7520	H15	9621	L 9
3675	J10	4501	B 8	4593	I19	5504	E20	6504	F19	7507	I 7	7521	I 4	9623	L 6
3676	J10	4502	H 8	4594	I19	56	H 2	6510	K14	7510	J19	7522	I 5	9624	L 6
3677	J10	4506	J15	4650	L 8	57	G22	6511	K15	7511	K18	7523	M 3		
3678	K10	4527	J14	4651	L 8	58	L21	70	G 1	7512	B20	7553	C12		
3679	K10	4529	L15	4652	M 8	59	I 1	71	J21	7513	C21	9513	K14		



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GND_A
PHONO/AUX_R
GND_M
TUNER_L
TO TUNER
TUNER_R
TO CD/3-CDC
TO VCD
CD_R
CD_L
TO DPL/FK
TO SK
VOCAL_FADER
TO TAPE MOTOR
TO MTP
TO ETP5
TAPE_L
TAPE_R
REC_L
REC_R
HP_SENSE
MUTE
I2C_DATA
I2C_CLK
VOCAL_FADER
CD_STBY
AMP_ON
PWR_DWN
STANDBY
NTC
CLIPPING
AB
To Front
For sets with PW5 module
SK/(FK+LO)
DP/(FK-LO)
NJM4560M
SOURCE-SELECTOR
LOGIC-CONTROL
I2C
INPUTA LEFT
INPUTB LEFT
INPUT MONO
INPUTC LEFT
MUTE
INPUTD LEFT
LINEAR OUT L
INPUTA RIGHT
INPUTB RIGHT
RIPPLE IN
INPUTC RIGHT
Vref
INPUTD RIGHT
LINEAR OUT R
VOLUME1 LOUDN. LEFT
BASS LEFT
TREBLE LEFT
VOLUME2 LEFT
VOLUME1 LOUDN. RIGHT
BASS RIGHT
TREBLE RIGHT
VOLUME2 RIGHT
Front
Rear
Vcc
SDA
7553
TEA6321
INCREDIBLE SURROUND
BC847C
HEADPHONE AMP.
NJM4556AM
MUTE
BC857B
BC817-25
HP SOCKET (Dia. 3.5mm)
TO POWER
AMP_ON
EMC PROVISION
FK GROUND
FILTER FOR FK SUPPLY
EMC SOL
70W/100W
1N4003
SUB-WOOFER OUT (SW)
YKC21-3415
AUX SOCKET (1L2P)
AUX IN + LINE-OUT PCB
AUX+LINE-OUT SOCKET (2L2P)
TO AF5
LINE OUT PCB FOR PW5
CD STANDBY SWITCH
BC327-25
Connector for
ECO'96
PW5
PW2
PW1/PW4

Note: Some values may varies, see variant table for correct value.

LEGEND :

DP : DOLBY PROLOGIC
SA : SPECTRUM ANALYSER
NK : NON KARAOKE
: PROVISION ON LAYOUT
* : INCREDIBLE SURROUND
LO : LINE OUT
SK : SIMPLE KARAOKE
FK : FULL FEATURE KARAOKE
HP : HEADPHONE
■ : SK/(FK+LO)/DP/(NK+LO)
SW : SUB-WOOFER OUT

FOR MIDI ONLY

ITEM	VALUE
3555,3556	1k8
3573,3574	8k2
3577,3578	1k
3603,3604	10k
3561,3562	27k
2541,2542	u47
3587,3588	100k
3614,3615	-
3616,3617	56k
2605,2606	-

4650, 4651 } Used when 1507 OR 1523 is used

1531, 9623, 9624 } For Power 5 Only

9620, 9621 } Provision for Dual Aux-In

ELECTRICAL PARTS LIST - AF5 BOARD

MISCELLANEOUS

1508	4822 267 40898	Headphone Socket
1513	4822 267 10737	Connector 18 pin
1522	4822 267 31729	Cinch Socket - Sub-woofer out
1530	4822 267 20452	Cinch Socket Line-out
1531	4822 267 20452	Cinch Socket Aux-in

CAPACITORS

2501	4822 122 33336	8,2nF 10% 50V
2502	4822 122 33336	8,2nF 10% 50V
2503	4822 124 41407	0,47µF 20% 63V
2504	4822 124 41407	0,47µF 20% 63V
2505	4822 124 40746	0,22µF 20% 63V
2506	4822 124 40746	0,22µF 20% 63V
2507	4822 121 42408	220nF 5% 63V
2508	4822 121 42408	220nF 5% 63V
2511	4822 121 51252	470nF 5% 63V
2512	4822 121 51252	470nF 5% 63V
2513	4822 122 32646	5,6nF 10% 50V
2514	4822 122 32646	5,6nF 10% 50V
2515	4822 124 81029	100µF 20% 25V
2516	4822 124 81029	100µF 20% 25V
2517	4822 121 51252	470nF 5% 63V
2518	4822 121 51252	470nF 5% 63V
2519	5322 122 32268	470pF 10% 50V
2520	5322 122 32268	470pF 10% 50V
2521	4822 124 40246	4,7µF 20% 63V
2522	4822 124 40246	4,7µF 20% 63V
2523	4822 126 12105	33nF 5% 63V
2524	4822 126 12105	33nF 5% 63V
2525	4822 126 13692	47pF 1% 63V
2526	4822 126 13692	47pF 1% 63V
2529	5322 122 32654	22nF 10% 63V
2531	5322 122 32268	470pF 10% 50V
2532	5322 122 32268	470pF 10% 50V
2533	4822 121 51252	470nF 5% 63V
2534	4822 121 51252	470nF 5% 63V
2535	4822 122 33219	1,8nF 10% 50V
2536	4822 122 33219	1,8nF 10% 50V
2537	5322 122 32531	100pF 5% 50V
2538	5322 122 32531	100pF 5% 50V
2539	4822 122 33891	3,3nF 10% 63V
2540	4822 122 33891	3,3nF 10% 63V
2541	4822 124 40433	47µF 20% 25V
2541	4822 124 41407	0,47µF 20% 63V /22/34
2542	4822 124 40433	47µF 20% 25V
2542	4822 124 41407	0,47µF 20% 63V /22/34
2543	4822 124 81151	22µF 50V
2544	4822 124 81151	22µF 50V
2545	5322 122 32268	470pF 10% 50V
2546	5322 122 32268	470pF 10% 50V
2547	5322 122 32654	22nF 10% 63V
2549	4822 124 40246	4,7µF 20% 63V
2550	4822 124 40246	4,7µF 20% 63V
2551	5322 122 32268	470pF 10% 50V
2552	5322 122 32268	470pF 10% 50V
2555	5322 122 32531	100pF 5% 50V
2557	5322 122 32654	22nF 10% 63V
2558	5322 122 32654	22nF 10% 63V
2559	5322 122 32531	100pF 5% 50V
2560	5322 122 32531	100pF 5% 50V
2561	5322 122 34123	1nF 10% 50V
2562	5322 122 34123	1nF 10% 50V
2563	5322 122 32448	10pF 5% 50V
2564	5322 122 32448	10pF 5% 50V
2573	4822 126 13836	1µF 16V
2574	4822 126 13836	1µF 16V
2575	4822 124 40246	4,7µF 20% 63V
2580	4822 124 40433	47µF 20% 25V
2581	4822 126 13838	100nF +80/-20% 50V
2582	4822 124 41751	47µF 20% 50V
2583	4822 124 81029	100µF 20% 25V
2584	4822 124 81029	100µF 20% 25V
2585	4822 124 41751	47µF 20% 50V
2586	4822 126 13838	100nF +80/-20% 50V
2587	4822 124 40246	4,7µF 20% 63V
2588	4822 124 40246	4,7µF 20% 63V
2590	5322 122 32654	22nF 10% 63V
2591	4822 126 13838	100nF +80/-20% 50V
2592	4822 126 13838	100nF +80/-20% 50V
2593	4822 122 33575	220pF 5% 50V
2594	4822 122 33575	220pF 5% 50V
2595	4822 122 32535	680pF 10% 63V
2596	4822 122 32535	680pF 10% 63V
2597	4822 126 13838	100nF +80/-20% 50V
2601	4822 124 40246	4,7µF 20% 63V
2602	4822 124 40246	4,7µF 20% 63V
2603	5322 122 32531	100pF 5% 50V
2604	5322 122 32654	22nF 10% 63V
2607	4822 126 13692	47pF 1% 63V
2609	5322 122 32531	100pF 5% 50V
2610	5322 122 32531	100pF 5% 50V
2611	5322 122 32658	22pF 5% 50V
2612	5322 122 32658	22pF 5% 50V
2615	4822 124 40246	4,7µF 20% 63V
2616	4822 124 40246	4,7µF 20% 63V
2617	5322 122 34123	1nF 10% 50V
2618	5322 122 34123	1nF 10% 50V
2619	5322 122 32654	22nF 10% 63V
2620	4822 124 40433	47µF 20% 25V
2621	5322 122 32658	22pF 5% 50V
2622	5322 122 32658	22pF 5% 50V
2623	5322 126 10223	4,7nF 10% 63V
2625	4822 126 13838	100nF +80/-20% 50V
2626	4822 126 13838	100nF +80/-20% 50V

ELECTRICAL PARTS LIST - AF5 BOARD

2627	4822 126 13838	100nF +80/-20% 50V
2630	5322 122 34123	1nF 10% 50V
2632	5322 122 32268	470pF 10% 50V
2634	4822 124 40242	1µF 20% 63V
2635	4822 124 81029	100µF 20% 25V
2636	4822 124 40242	1µF 20% 63V
2637	4822 122 32504	15pF 2% 63V
2638	5322 122 32531	100pF 5% 50V
2641	4822 122 33175	2,2nF 20% 50V
2643	4822 126 13836	1µF 16V
2644	4822 124 41407	0,47µF 20% 63V
2645	4822 124 41407	0,47µF 20% 63V
2646	4822 126 13836	1µF 16V
2647	4822 126 13836	1µF 16V
2671	4822 126 13836	1µF 16V
2672	4822 126 13836	1µF 16V
2673	4822 122 33175	2,2nF 20% 50V
2674	4822 122 33175	2,2nF 20% 50V
2675	5322 122 32654	22nF 10% 63V
2676	5322 122 32654	22nF 10% 63V
2677	4822 122 33575	220pF 5% 50V
2678	5322 122 32654	22nF 10% 63V

RESISTORS

3501	4822 117 10833	10k 1% 0,1W
3502	4822 116 83864	10k 5% 0,5W
3503	4822 051 20562	5k6 5% 0,1W
3504	4822 051 20562	5k6 5% 0,1W
3505	4822 051 20332	3k3 5% 0,1W
3506	4822 051 20332	3k3 5% 0,1W
3507	4822 051 20153	15k 5% 0,1W
3508	4822 051 20153	15k 5% 0,1W
3509	4822 051 20683	68k 5% 0,1W
3510	4822 051 20683	68k 5% 0,1W
3511	4822 051 20223	22k 5% 0,1W
3512	4822 051 20223	22k 5% 0,1W
3513	4822 117 11449	2k2 1% 0,1W
3514	4822 117 11449	2k2 1% 0,1W
3515	4822 051 20472	4k7 5% 0,1W
3516	4822 051 20472	4k7 5% 0,1W
3517	4822 051 20472	4k7 5% 0,1W
3518	4822 051 20472	4k7 5% 0,1W
3519	4822 051 20822	8k2 5% 0,1W
3520	4822 051 20822	8k2 5% 0,1W
3523	4822 051 20822	8k2 5% 0,1W
3524	4822 051 20822	8k2 5% 0,1W
3525	4822 117 11449	2k2 1% 0,1W
3526	4822 117 11449	2k2 1% 0,1W
3527	4822 051 20153	15k 5% 0,1W
3528	4822 051 20153	15k 5% 0,1W
3529	4822 051 20562	5k6 5% 0,1W
3530	4822 051 20153	15k 5% 0,1W
3531	4822 051 20562	5k6 5% 0,1W
3532	4822 051 20562	5k6 5% 0,1W
3533	4822 051 20684	680k 5% 0,1W
3534	4822 051 20684	680k 5% 0,1W
3535	4822 051 20224	220k 5% 0,1W
3536	4822 051 20224	220k 5% 0,1W
3537	4822 117 10833	10k 1% 0,1W
3538	4822 117 10833	10k 1% 0,1W
3539	4822 117 10833	10k 1% 0,1W
3540	4822 117 10833	10k 1% 0,1W
3541	4822 051 20822	8k2 5% 0,1W
3542	4822 051 20822	8k2 5% 0,1W
3543	4822 117 10834	47k 1% 0,1W
3544	4822 117 10834	47k 1% 0,1W
3545	4822 051 20562	5k6 5% 0,1W
3546	4822 051 20562	5k6 5% 0,1W
3547	4822 116 83864	10k 5% 0,5W
3548	4822 117 11449	2k2 1% 0,1W
3549	4822 051 20562	5k6 5% 0,1W
3550	4822 051 20562	5k6 5% 0,1W
3551	4822 051 20822	8k2 5% 0,1W
3552	4822 051 20822	8k2 5% 0,1W
3553	4822 051 10102	1k 2% 0,25W
3554	4822 051 10102	1k 2% 0,25W
3555	4822 117 11454	820R 1% 0,1W
3556	4822 117 11454	820R 1% 0,1W
3557	4822 051 20273	27k 5% 0,1W
3558	4822 051 20273	27k 5% 0,1W
3559	4822 117 11507	6k8 1% 0,1W
3560	4822 117 11507	6k8 1% 0,1W
3561	4822 051 20153	15k 5% 0,1W
3562	4822 051 20153	15k 5% 0,1W
3563	4822 051 20104	100k 5% 0,1W
3564	4822 051 20104	100k 5% 0,1W
3565	4822 116 52195	47R 5% 0,5W
3566	4822 051 20479	47R 5% 0,1W
3567	4822 116 52195	47R 5% 0,5W
3568	4822 051 20479	47R 5% 0,1W
3569	4822 051 10102	1k 2% 0,25W
3570	4822 051 10102	1k 2% 0,25W
3571	4822 117 11149	82k 1% 0,1W
3572	4822 117 11149	82k 1% 0,1W
3573	4822 117 11503	220R 1% 0.1W
3574	4822 117 11503	220R 1% 0.1W
3575	4822 051 20228	2R2 5% 0,1W
3577	4822 051 20472	4k7 5% 0,1W
3578	4822 051 20472	4k7 5% 0,1W
3579	4822 116 83864	10k 5% 0,5W
3580	4822 117 12955	2k7 1% 0,1W
3581	4822 117 10833	10k 1% 0,1W
3582	4822 050 11002	1k 1% 0,4W
3583	4822 050 11002	1k 1% 0,4W

ELECTRICAL PARTS LIST - AF5 BOARD

RESISTORS

3584	4822 050 24705	4M7 1% 0,6W
3585	4822 051 20472	4k7 5% 0,1W
3586	4822 051 10102	1k 2% 0,25W
3587	4822 116 83874	220k 5% 0,5W
3588	4822 051 20224	220k 5% 0,1W
3589	4822 051 20562	5k6 5% 0,1W
3591	4822 051 20562	5k6 5% 0,1W
3592	4822 051 20224	220k 5% 0,1W
3593	4822 051 10102	1k 2% 0,25W
3594	4822 051 10102	1k 2% 0,25W
3595	4822 051 20562	5k6 5% 0,1W
3601	4822 051 20683	68k 5% 0,1W
3602	4822 051 20683	68k 5% 0,1W
3603	4822 117 11139	1k5 1% 0,1W
3604	4822 117 11139	1k5 1% 0,1W
3605	4822 117 11449	2k2 1% 0,1W
3606	4822 117 11449	2k2 1% 0,1W
3608	4822 117 11449	2k2 1% 0,1W
3609	4822 117 11449	2k2 1% 0,1W
3611	4822 051 20392	3k9 5% 0,1W
3612	4822 051 20472	4k7 5% 0,1W
3613	4822 117 11454	820R 1% 0,1W
3631	4822 116 52195	47R 5% 0,5W
3632	4822 116 52195	47R 5% 0,5W
3633	4822 051 20224	220k 5% 0,1W
3634	4822 051 20224	220k 5% 0,1W
3635	4822 052 10109 ⚠	10R 5% 0,33W
3636	4822 051 10102	1k 2% 0,25W
3637	4822 052 10229	22R 5% 0,33W
3639	4822 051 20392	3k9 5% 0,1W
3640	4822 051 20392	3k9 5% 0,1W
3641	4822 051 20562	5k6 5% 0,1W
3642	4822 051 20562	5k6 5% 0,1W
3643	4822 051 20822	8k2 5% 0,1W
3644	4822 051 20822	8k2 5% 0,1W
3645	4822 051 20182	1k8 5% 0,1W
3646	4822 051 20182	1k8 5% 0,1W
3647	4822 051 20101	100R 5% 0,1W
3648	4822 051 20101	100R 5% 0,1W
3652	4822 051 20471	470R 5% 0,1W
3654	4822 051 20392	3k9 5% 0,1W
3655	4822 117 12955	2k7 1% 0,1W
3656	4822 051 20471	470R 5% 0,1W
3657	4822 117 11449	2k2 1% 0,1W
3658	4822 051 20229	22R 5% 0,1W
3663	4822 051 10102	1k 2% 0,25W
3664	4822 051 10102	1k 2% 0,25W
3674	4822 117 11449	2k2 1% 0,1W
3675	4822 117 11449	2k2 1% 0,1W
3675	4822 051 20332	3k3 5% 0,1W /22/34
3690	4822 052 10478	4R7 5% 0,33W
3701	4822 051 10102	1k 2% 0,25W
3702	4822 051 10102	1k 2% 0,25W
3907	4822 051 20334	330k 5% 0,1W
4501	4822 051 20008	0R Jumper 0805
4502	4822 051 20008	0R Jumper 0805
4506	4822 051 20008	0R Jumper 0805
4508	4822 051 10008	0R Jumper 1206
4509	4822 051 20008	0R Jumper 0805
4510	4822 051 10008	0R Jumper 1206
4512	4822 051 20008	0R Jumper 0805
4513	4822 051 20008	0R Jumper 0805
4514	4822 051 20008	0R Jumper 0805
4515	4822 051 10008	0R Jumper 1206
4517	4822 051 20008	0R Jumper 0805
4518	4822 051 20008	0R Jumper 0805
4519	4822 051 10008	0R Jumper 1206
4520	4822 051 10008	0R Jumper 1206
4521	4822 051 20008	0R Jumper 0805
4522	4822 051 10008	0R Jumper 1206
4523	4822 051 20008	0R Jumper 0805
4524	4822 051 10008	0R Jumper 1206
4525	4822 051 10008	0R Jumper 1206
4526	4822 051 20008	0R Jumper 0805
4527	4822 051 20008	0R Jumper 0805
4528	4822 051 20008	0R Jumper 0805
4530	4822 051 20008	0R Jumper 0805
4531	4822 051 10008	0R Jumper 1206
4532	4822 051 20008	0R Jumper 0805
4533	4822 051 10008	0R Jumper 1206
4534	4822 051 20008	0R Jumper 0805
4535	4822 051 20008	0R Jumper 0805
4539	4822 051 20008	0R Jumper 0805
4541	4822 051 20008	0R Jumper 0805
4542	4822 051 20008	0R Jumper 0805
4548	4822 051 20008	0R Jumper 0805
4550	4822 051 20008	0R Jumper 0805
4551	4822 051 20008	0R Jumper 0805
4552	4822 051 20008	0R Jumper 0805
4553	4822 051 20008	0R Jumper 0805
4554	4822 051 20008	0R Jumper 0805
4555	4822 051 10008	0R Jumper 1206
4556	4822 051 20008	0R Jumper 0805
4557	4822 051 10008	0R Jumper 1206
4558	4822 051 10008	0R Jumper 1206
4559	4822 051 10008	0R Jumper 1206
4560	4822 051 10008	0R Jumper 1206
4561	4822 051 20008	0R Jumper 0805
4562	4822 051 10008	0R Jumper 1206
4569	4822 051 10008	0R Jumper 1206
4572	4822 051 10008	0R Jumper 1206
4573	4822 051 20008	0R Jumper 0805
4574	4822 051 20008	0R Jumper 0805
4580	4822 051 10008	0R Jumper 1206

ELECTRICAL PARTS LIST - *AF5 BOARD*

RESISTORS

593	4822 051 20008	0R Jumper 0805
594	4822 051 20008	0R Jumper 0805
600	4822 051 20008	0R Jumper 0805
601	4822 051 10008	0R Jumper 1206
602	4822 051 10008	0R Jumper 1206
603	4822 051 10008	0R Jumper 1206
604	4822 051 10008	0R Jumper 1206
605	4822 051 10008	0R Jumper 1206
606	4822 051 20008	0R Jumper 0805
607	4822 051 20008	0R Jumper 0805
608	4822 051 20008	0R Jumper 0805
609	4822 051 20008	0R Jumper 0805
610	4822 051 20008	0R Jumper 0805
611	4822 051 10008	0R Jumper 1206
612	4822 051 10008	0R Jumper 1206
613	4822 051 20008	0R Jumper 0805
614	4822 051 20008	0R Jumper 0805
615	4822 051 10008	0R Jumper 1206
616	4822 051 10008	0R Jumper 1206
617	4822 051 10008	0R Jumper 1206
618	4822 051 10008	0R Jumper 1206
622	4822 051 10008	0R Jumper 1206
623	4822 051 20008	0R Jumper 0805
624	4822 051 20008	0R Jumper 0805
625	4822 051 10008	0R Jumper 1206
626	4822 051 10008	0R Jumper 1206
628	4822 051 10008	0R Jumper 1206
629	4822 051 20008	0R Jumper 0805
630	4822 051 20008	0R Jumper 0805
631	4822 051 20008	0R Jumper 0805
632	4822 051 20008	0R Jumper 0805
640	4822 051 20008	0R Jumper 0805
641	4822 051 10008	0R Jumper 1206
642	4822 051 20008	0R Jumper 0805
643	4822 051 10008	0R Jumper 1206
644	4822 051 20008	0R Jumper 0805
645	4822 051 20008	0R Jumper 0805
653	4822 051 20008	0R Jumper 0805
657	4822 051 20008	0R Jumper 0805

COILS & FILTERS

501	4822 156 21721	Fixed Inductor 2µ2 10%
502	4822 156 21721	Fixed Inductor 2µ2 10%
503	4822 156 21721	Fixed Inductor 2µ2 10%
504	4822 156 21721	Fixed Inductor 2µ2 10%

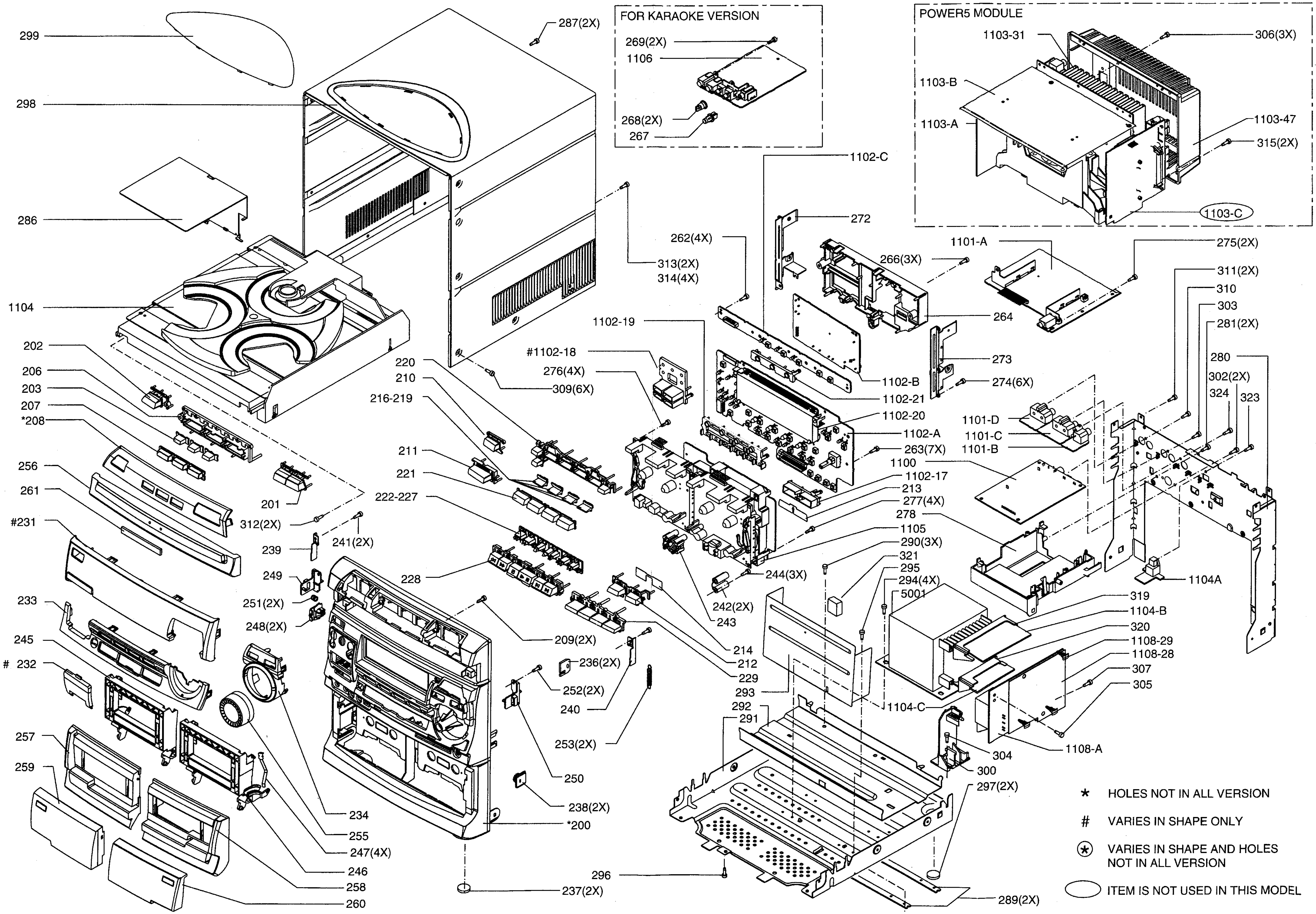
DIODES

501	4822 130 30862	BZX79-B9V1
503	4822 130 30862	BZX79-B9V1
504	4822 130 30621	1N4148
510	4822 130 31878	1N4003G

TRANSISTORS & INTEGRATED CIRCUITS

7501	4822 209 31378	NJM4556MB
7502	4822 130 42804	BC817-25
7503	4822 130 42804	BC817-25
7504	4822 130 42804	BC817-25
7505	5322 130 42755	BC847C
7507	4822 209 83357	NJM4560M
7511	5322 130 42755	BC847C
7512	5322 130 42755	BC847C
7513	5322 130 42755	BC847C
7514	5322 130 60508	BC857B
7515	4822 130 41246	BC327-25
7516	5322 130 42755	BC847C
7517	5322 130 42755	BC847C
7518	5322 130 42755	BC847C
7519	5322 130 42755	BC847C
7520	5322 130 42755	BC847C
7521	5322 130 42755	BC847C
7522	5322 130 42755	BC847C
7523	5322 130 42755	BC847C
7553	4822 209 33652	TEA6321T/V1

Note: Only the parts mentioned in this list are normal service spare parts.


FOR KARAOKE VERSION
269(2X)
1106
268(2X)
267
POWER5 MODULE
1103-31
306(3X)
1103-B
1103-A
1103-47
315(2X)
1103-C
299
298
287(2X)
286
1104
313(2X)
314(4X)
1102-C
272
262(4X)
266(3X)
1101-A
275(2X)
311(2X)
310
303
281(2X)
264
1102-19
#1102-18
276(4X)
309(6X)
1102-B
1102-21
1102-20
1102-A
273
274(6X)
280
302(2X)
324
323
1101-D
1101-C
1101-B
263(7X)
1100
1102-17
213
277(4X)
278
1105
290(3X)
321
295
294(4X)
5001
244(3X)
242(2X)
243
1104A
319
1104-B
320
1108-29
1108-28
307
305
1108-A
1104-C
304
300
297(2X)
293
292
291
296
289(2X)
202
206
203
207
*208
256
261
#231
233
245
# 232
257
259
220
210
216-219
211
221
222-227
228
201
312(2X)
241(2X)
239
249
251(2X)
248(2X)
209(2X)
236(2X)
252(2X)
240
253(2X)
214
212
229
250
238(2X)
*200
237(2X)
234
255
247(4X)
246
258
260

* HOLES NOT IN ALL VERSION

# VARIES IN SHAPE ONLY

⊛ VARIES IN SHAPE AND HOLES NOT IN ALL VERSION

○ ITEM IS NOT USED IN THIS MODEL

MECHANICAL & ACCESSORIES PARTS LIST - MAIN UNIT

200	4822 459 04891	Cabinet Front
200	4822 459 04929	Cabinet Front /21/21M
201	4822 410 11579	Button Set Open-Close
202	4822 410 11655	Button RDS/CD text
206	4822 410 11582	Button Set Holder CDC Select
207	4822 410 11583	Button Set CDC Select
208	4822 450 10425	Window Display CDC
208	4822 450 10472	Window Display CDC /21/21M
210	4822 410 11584	Button Standby-On
211	4822 410 11585	Button Digital Sound
212	4822 410 11586	Button Set DBB/IS
220	4822 410 11588	Button Set Holder Source
221	4822 410 11589	Button Set Source Select
228	4822 410 11591	Button Set Controls
229	4822 410 11592	Button Set CS/DUB/Dolby/RM
231	4822 450 10446	Window Disp. FW850C/22/34
231	4822 450 10473	Window Disp. FW850C/21/21M
231	4822 450 10471	Window Disp. FW855C/34
231	4822 450 10485	Window Disp FW855C/21/21M
232	4822 450 10447	Window DSC
233	4822 442 01197	Panel Cover Controls
234	4822 442 01198	Panel Cover DBB/IS
237	4822 462 40683	Plate (Foot)
238	4822 529 10322	Damper Assembly
245	4822 443 10487	Door Cassette Left
246	4822 443 10488	Door Cassette Right
247	4822 492 42787	Spring Cassette
248	4822 402 10621	Push-Catch
251	4822 492 11344	Spring Compression
253	4822 492 11345	Spring Tension
255	4822 410 11594	Knob Volume Rotary
256	4822 442 01199	Cover Tray CDC
257	4822 442 01201	Cover Door Cassette Left
258	4822 442 01202	Cover Door Cassette Right
259	4822 450 10426	Lens Cassette Left
260	4822 450 10427	Lens Cassette Right
261	4822 459 11055	Badge (Philips) Assembly
267	4822 410 11596	Knob Vocal Fader /21/21M
268	4822 410 11595	Knob Karaoke /21/21M
297	4822 462 40683	Plate (Foot)
298	4822 426 10584	Cabinet Rear
299	4822 450 10429	Window CDC
349	4822 445 10749	Surr. Loudspeaker FW855C
350	4822 445 10716	Left Speaker
	4822 445 10714	Left Speaker FW850C/22
350	4822 445 10717	Right Speaker
	4822 445 10715	Right Speaker FW850C/22
351	4822 303 50063	FM Aerial
356	4822 219 10432	Remote Control RC07100/01
384	4822 303 50082	AM Frame
385	4822 321 10249 ⚠	Mains Cord
387	4822 736 15909	Instruction For Use /22
387	4822 736 15973	Instruction For Use /21/21M
387	4822 736 15972	Instruction For Use /34
1603	4822 323 10421	Flex Cable 12pin 10cm
1604	4822 323 10422	Flex Cable 4pin 40cm /22/34
5001	4822 146 10929 ⚠	Mains Transformer /22/34
5001	4822 146 10952 ⚠	Mains Transformer /21/21M

NOTE: Only the parts mentioned in this list are normal service spare parts.

SCREW LISTS - MAIN UNIT

209	D2 x 8
241	D3 x 10
244	D3 x 30
252	D3 x 12
262	D3 x 10
263	D3 x 10
266	D3 x 12
269	D3 x 12
274	D3 x 12
275	D3 x 12
276	D3 x 12
277	D3 x 30
281	D3 x 12
287	D3 x 10
290	M3 x 6
294	M3 x 10
295	M3 x 6
296	M3 x 10
302	D3 x 12
303	D3 x 12
304	M3 x 10
305	D3 x 10
306	M3 x 10
307	D3 x 12
309	D3 x 10
310	D3 x 12
311	D3 x 10
312	D3 x 10
313	D3 x 10
314	M3 x 10
315	M3 x 10
323	D3 x 10
324	D3 x 12